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Soils of the Port au Port Peninsula, Newfoundland

Report No. 4
Newfoundland Soil Survey

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REPORT ON THE SOILS OF THE PORT AU PORT PENINSULA

ABSTRACT

This survey was conducted as a joint federal-provincial project to determine the soil resources of the Port au Port Peninsula in western Newfoundland.

The report contains geographical and background information on the area, and a detailed description of the many different kinds of soils and their origins, with special reference to their productive potential. Analytical data are presented for most of the soils. A soil map at a scale of 1:63 360 accompanies the report.

ACKNOWLEDGMENTS

The soil survey of the Port au Port Peninsula was a joint project of the Canada Land Inventory, Agriculture Canada, and the Newfoundland Department of Mines, Agriculture and Resources. The field work was carried out by the senior author, with the assistance of D.G. Butler and P.A. Greenlee.

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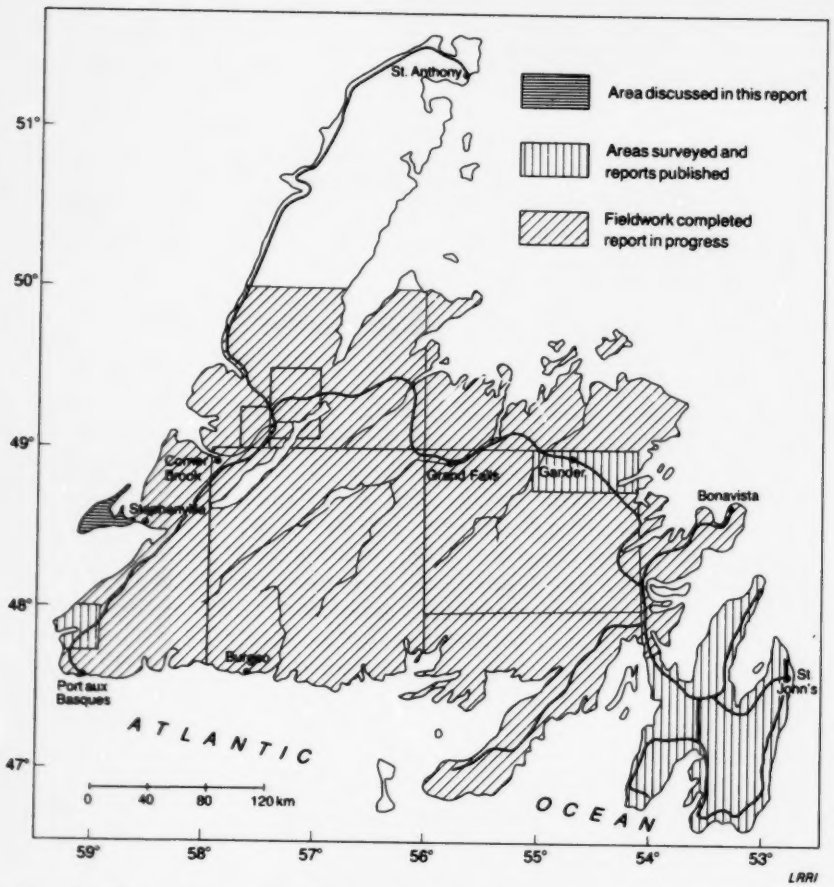

Fig. 1. The island of Newfoundland and the location of the surveyed area.

INTRODUCTION

The Port au Port Peninsula covers an area of about 149 km^2 or 38 536 ha. Port au Port Bay was discovered before 1650 by French fishermen, but there was no settlement until the middle of the 19th century. Much of the settlement has taken place in the 20th century.

The economy of the Peninsula depends mainly on fishing and the cutting of pulpwood for the Bowater mill at Cornerbrook. A subsistence type of agriculture is practiced in conjunction with fishing and lumbering. The Port au Port Peninsula possesses many important deposits of some of the highest quality limestone in the world.

The population of the Peninsula has increased steadily since 1857. Lourdes is the largest settlement, followed by Piccadilly, De Grau, Boswarlos, and West Bay in decreasing size of population. The Peninsula is adequately supplied with roads and is 27 km by paved road from the nearest railway.

The cool, maritime climate Murray and Harmon (1969) has a mean annual temperature of about 4.4°C. The frost-free season ranges from about 140 to 150 days.

The soil parent materials are sandstone and glacial and glaciofluvial deposits derived from sandstones, shales, limestone, dolomite, and igneous and metamorphic rocks. Soil textures range from loamy sand to silty clay. The well-drained soils (28.5% of the area) have well-developed Podzolic or fairly well-developed Luvisolic profiles. The soils with imperfect drainage (17.3%), because of the parent material or topographic characteristics, have mottling or gleying, especially in the lower part of the profile. The poorly drained soils (13.9%) are strongly gleyed in all horizons and belong to the Gleysol and Eluviated Gleysol great groups. An abundance of streams give adequate surface drainage to the Peninsula.

The landscape of the Peninsula has a strong relief. Gently sloping to rolling lowlands are bordered by steeply sloping hillsides of a cuesta form ridge. Elevations range from sea level to 335 meters. Much of the Peninsula is forested, and there are about 116 km^2 of productive pulpwood forest. The main trees are balsam fir and black spruce.

The fine-textured soils occupy about 28.7% of the Peninsula, medium-textured soils about 24.3%, moderately coarse-textured soils about 5.8%, and coarse-textured soils about 0.5%. The remainder consists of miscellaneous soils and land types including peat, barrens, marsh, rockland, coastal beach, and quarries.

The soils of the area were mapped as series. The characteristics of each soil series, or mapping unit, are described in detail in the report.

About 2.5% of the Peninsula is occupied by 329 farms, ranging from about 0.5 ha to about 10 ha in size. Most of the farm land is improved and is used for hay and pasture to support livestock. Small areas are used for growing potatoes, cabbage, and turnips for home consumption. Sheep, cattle, and hens are the most important livestock. Most of the farms are of the subsistence type where fishing, farming, and lumbering are combined operations. Generally, farm incomes are low.

Only about 24.9% of the land area is suitable for agriculture, including improved pasture. About 1.3% is fairly good land with moderately severe limitations that can be corrected with simple management practices such as erosion control, fertilization and liming, and rock picking. Another 5% is severely limited in use by natural features of slope, wetness, droughtiness, low fertility, stoniness, or rockiness; the choice of crops is limited. The remaining 18.6% of the land suitable for agriculture has such severe limitations that it can be used only for growing perennial forage crops. The rest of the land is best suited to forest. Some small areas of soils could be developed to a greater extent than they are at present. There are others that should be allowed to revert to forest.

All the soils are acid and need lime for best results in crop production. Fertilizers are required to obtain good yields. A fairly high level of organic matter is needed in the coarser textured soils for desirable moisture relationships.

GENERAL DESCRIPTION OF THE AREA

LOCATION AND EXTENT

The Port au Port Peninsula (Fig. 1) is situated on the west coast of Newfoundland between 48°47' and 48°28' north latitude, and between 59°16' and 58°44' west longitude. It is bounded on the south by St. George's Bay, on the west and north by the Gulf of St. Lawrence, and on the east by Port au Port Bay. It is connected on the east to the mainland of Newfoundland by two narrow necks of land. A road on one neck links the Peninsula with the mainland. The Peninsula has an area of about 386 km^2, or 38 590 ha.

HISTORY AND DEVELOPMENT

Port au Port Bay was discovered before 1650 by French fishermen, but settlement did not begin until the middle of the nineteenth century. The 1857 census of Newfoundland lists only 39 people living around the Bay.

The fishing rights along the entire west coast of Newfoundland were granted to the French by the Treaty of Utrecht in 1713 and were not relinquished until 1904. Much of the settlement of the Port au Port Peninsula has taken place since that date. In 1945, the ethnic ancestry of the population in the St. George's-Port au Port region was 46% French, 36% English, 6% Irish, 7% Scottish, and 3% Métis. The population has risen steadily since 1885.

The Port au Port Peninsula was first settled for cod and herring fishing, but today lobster fishing nearly equals cod fishing in importance. Scallops are frozen at a fish plant in Piccadilly.

Agricultural development on the Peninsula has been limited to small-scale subsistence-type farming in conjunction with fishing and small-scale lumbering operations. A few small sawmills are in operation. Most of the available arable land is used for hay and pasture to feed small numbers of livestock raised for home use. Small quantities of potatoes, turnips, and cabbage are grown for home consumption, and sheep wool is sold.

Some important limestone deposits are located on the Peninsula. The limestone contains 96-98% calcium carbonate and is among the world's highest quality limestone. In 1913, the Dominion Steel and Coal Corporation opened a limestone quarry at Aguathuna. It employed 125 men until it ceased operation several years ago. Limestone was shipped to Sydney, N.S., and to Bell Island, Nfld. A plant that used limestone and sea water to produce magnesium hydroxide and magnesium oxide, which are used in the pulp and paper industry, later occupied the quarry site. The products were shipped up the St. Lawrence River and down the east coast of the United States. This plant has also closed.

The eastern tip of the Port au Port Peninsula is 27 km by paved road from the nearest Canadian National Railway line at Stephenville Crossing and 12.8 km by paved road from an airport at Harmon Field, Stephenville, served by national and regional airlines. See the maps in the back pocket of the report for information on transportation routes and settlements.

FACTORS IN SOIL FORMATION

Soil formation and development are influenced by climate, parent material, vegetation, drainage, topography, and time. In this section these factors are discussed in their relation to soil development on the Port au Port Peninsula.

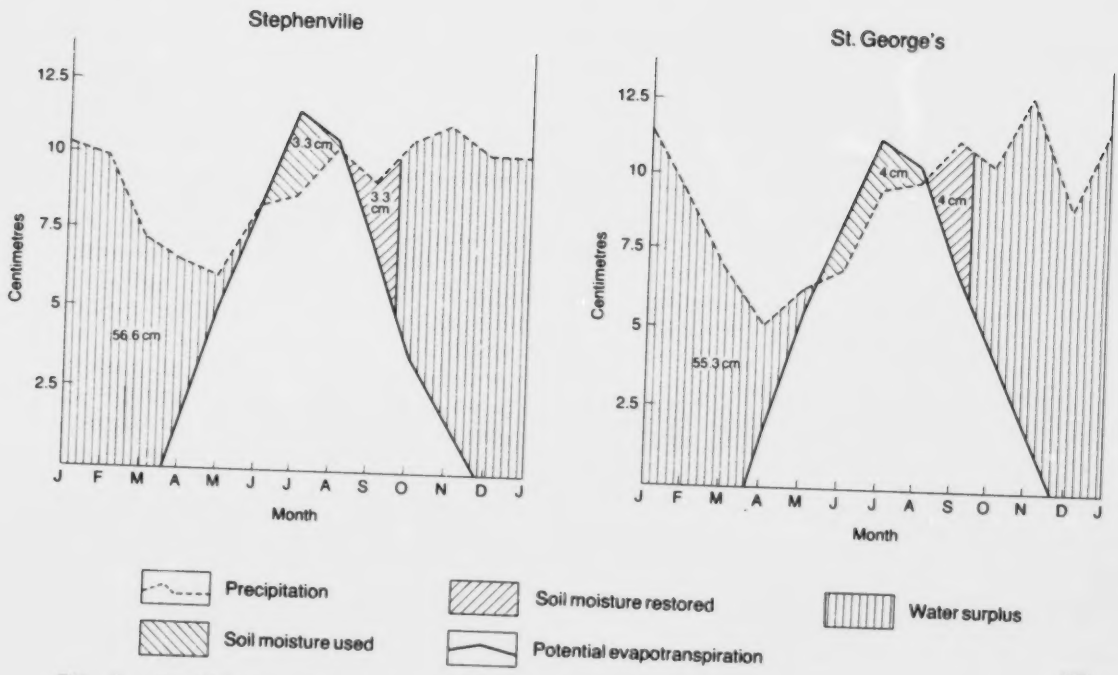

Fig. 2. Monthly changes in precipitation and soil moisture conditions at two stations on the Port au Port Peninsula.

CLIMATE

The climate governs, to a large extent, the intensity or rate at which soil develops, and is a major factor in soil formation. It determines the kind of vegetation and hence the kind of organic matter that is added to the soil as well as the amount of organic accumulation on the surface.

In general, the lowland areas of the Peninsula have higher mean temperatures than the upland areas, and the soils warm up earlier in the spring. There are two weather stations near the Port au Port Peninsula: Stephenville and St. George's; pertinent data on temperature and precipitation are given in Table 1.

Very little difference exists between the two stations in the mean seasonal or annual temperatures, annual precipitation, or frost-free period (Table 2). However, these are average values, and there may be local variations. The data are probably representative of the extreme outer coast of the Port au Port Peninsula and of the lowland bog areas. However, variations in temperature could be expected over much of the Peninsula where elevations range from 76 to 335 m above sea level. The frost-free period is a few days shorter in the extreme upland regions.

Moisture deficiency in the soil is not usual (Fig. 2), but there may be deficiencies in some years. This is fairly common in very sandy or gravelly soils. The relatively cool, humid climate favors the process of leaching and loss of nutrients from the soil.

Thornthwaite (1948) has devised a method for determining the effectiveness of precipitation by comparing precipitation with water need, or potential evapotranspiration. By this system the potential evapotranspiration can be computed for any region for which the mean temperature and precipitation are known. It is assumed that the soil can store the equivalent of 10 cm of rainfall. If rainfall exceeds evaporation, a surplus results. On the west coast of Newfoundland this usually happens during the fall, winter, and spring. During the summer, evapotranspiration usually exceeds rainfall, and a deficiency may result. In an average year the soil moisture is reduced little by evaporation during summer at the Stephenville and St. George's stations, but there may be moisture deficiencies in some years. Also, very sandy or gravelly soils do not hold the equivalent of 10 cm of rainfall and are severely deficient in moisture during an extended dry period in the growing season.

Table 1. Precipitation and temperature at two locations near the Port au Port Peninsula

Month	Stephenville temperature (°C)	Stephenville precipitation* (cm) rain	snow	total	St. George's temperature (°C)	St. George's precipitation (cm) rain	snow	total
December	-2.2	1.3	91	10.4	-2.2	3.8	53*	9.1
January	-4.4	0.8	96	10.4	-6.2	2.8	86	11.4
February	-5.5	2.1	81	10.2	-8.3	1.0	81	9.1
Winter	-3.8	4.2	268	31.0	-5.5	7.6	220	29.6
March	-2.9	1.0	64	7.4	-3.9	2.2	46	6.8
April	1.6	4.1	25	6.6	1.1	4.1	10	5.1
May	6.6	5.6	5	6.1	6.6	6.4	--	6.4
Spring	-1.6	10.7	94	20.1	1.1	12.7	56	18.3
June	11.6	8.6	--	8.6	11.1	6.9	--	6.9
July	16.1	8.9	--	8.9	15.5	9.7	--	9.7
August	16.1	10.4	--	10.4	16.1	9.9	--	9.9
Summer	14.4	27.9	--	27.9	14.4	26.5	--	26.5
September	12.2	9.4	--	9.4	12.1	11.4	--	11.4
October	7.2	10.7	2	10.9	7.2	9.9	5	10.4
November	2.8	9.1	23	11.4	2.2	9.4	36	13.0
Fall	7.2	29.2	25	31.7	7.2	30.7	41	34.8
Year	4.4	72.0	387	110.7	4.4	77.5	317	109.2

*Snowfall: 10 cm of snow equals 1 cm of rain.

Table 2. Average dates of frost and number of frost-free days at two stations near the map area

Station	Elevation (mm)	Frost-free period: average dates	average days	longest	shortest
Stephenville (10 yrs)	13.4	18 May-15 Oct.	150	176	128
St. George's (48-50 yrs)	3.4	25 May-12 Oct.	140		

NATURAL VEGETATION

Vegetation is an important factor in soil formation and development. Upon decaying, it adds organic matter to the soil, which has a considerable effect on soil-forming processes, including biological activity.

There are about 116.5 km^2 of productive pulpwood forest land on the Port au Port Peninsula. This land is covered predominantly with softwood, and a few hardwood species grow as shrubs throughout most of it.

Drainage influences the type of trees that grow in a region. The well-drained soils support such species as balsam fir, white spruce, white birch, maple, mountain ash, and pin cherry. Imperfectly drained sites have a cover of black spruce, balsam fir, larch, and speckled alder. The poorly drained areas are covered with black spruce, larch, and speckled alder, and many sites are dominated by speckled alder. Very poorly drained sites are occupied by peat bogs composed mainly of sphagnum moss, sedges, cotton-grass, and baked-apple, with black spruce, larch, and speckled alder around the margins. Deciduous trees predominate in some poorly drained lowlands. On the uplands and slopes, balsam fir is the main conifer. It is more suitable for pulpwood than for saw timber. In areas cut over for pulpwood, firewood, and local sawmills, the dominant new growth is balsam fir. The ground cover on rock barrens is mainly sheep-laurel, Labrador-tea, blueberry, scattered common juniper, and stunted black spruce, together with numerous other small shrubs of no commercial value.

PARENT MATERIALS

The characteristics of the parent materials have a strong influence on the kind of soil that develops. On the Port au Port Peninsula the materials were derived from a mixture of igneous and metamorphic rocks and the underlying sedimentary rocks. The glacial drift cover on the Peninsula is thin and in some areas absent.

The rocks underlying the Peninsula (Fig. 3) can be grouped into three main classes (Riley 1962): Ordivician limestone, shale, dolomite, and marble in upland areas; Ordivician clastic sediments of conglomerate, sandstone, and shale with intercalated beds of limestone in lowland areas; and Ordivician fossiliferous limestone, sandstone, and shale on Long Point. Other smaller formations include Carboniferous shale, sandstone, limestone, and conglomerate from Boswarlos to Piccadilly Bay and in other small isolated patches; Devonian sandstone, siltstone, shale, conglomerate, and limestone outcropping along the west side of

the Peninsula from Black Duck Brook to Salmon Cove; and Cambrian siltstone, shale, limestone, dolomite and sandstone outcropping along the southwest shore of the Peninsula from Petit Jardin to Marches Point. The weathering of these groups or rocks produced materials with a wide range of texture and stoniness.

During the last glacial period the Port au Port Peninsula, in common with most of Canada, was covered with a thick sheet of ice. Weathered and unweathered materials derived from the underlying rocks were mixed and transported by the ice and glacial meltwater. They were deposited either as unsorted glacial drift or as sorted materials in kames, eskers, or outwash plains. These deposits are the parent materials of the present-day soils.

Fine-textured glacial till covers most of the lowland and small portions of the upland areas of the Peninsula (Fig. 4). Most of it has been derived from red, green, and black shale; sandstone and limestone; and gray, buff, and pink dolomite and limestone. It has a clay loam to silty clay texture and is moderately to slowly permeable to water. It is about 60-150 cm deep.

Medium-textured till occupies most of the upland and the areas between the lowland and upland. Most of it has been derived from gray, buff, and pink dolomite and limestone. It is moderately permeable to water and has a loam to silt loam texture. This till is moderately to very stony and has a depth of 30-120 cm.

Moderately coarse-textured till occurs in the lowland along the southeast coast of the Peninsula. It has been derived from the same kind of rocks as the medium-textured till, but has a sandy loam texture. It is fairly permeable to water, moderately to very stony, and has a depth of 60-120 cm.

Most of the higher mountain slopes and crests are covered by a thin layer of partly decomposed peat over limestone and dolomite. However, much of the bedrock is bare. A soil developed on material derived from red sandstone, shale, and conglomerate occurs along the northwest coast of the Peninsula between Lourdes and Winterhouse. It is moderately to slowly permeable to water, slightly stony, and has a sandy loam texture.

The glaciofluvial materials consist of stratified sands and gravels. They have a low moisture-holding capacity, but are free of large stones. Soils developed from these materials have a loam to loamy sand texture.

Along some of the present-day streams, there are grayish brown, fine sandy loam to silt loam alluvial deposits of recent origin. They have not been in place long enough to show the effects of the soil development processes.

Throughout the Peninsula, there are some large areas and numerous small areas of organic deposits, usually formed by the filling of lakes and wet depressions. Most of the material is slightly humified sphagnum moss, sedges, and woody material. Gravelly beaches are common along the coast.

TOPOGRAPHY AND DRAINAGE

The effects of topography and drainage are reflected in differences in soils developed from the same kind of parent materials. Topography and the kind of parent material determine the amount of water that percolates through, or is held in, the soil.

The Port au Port Peninsula is an eroded highland remnant (Johnson 1954) of resistant limestone and dolomite Riley (1962). It is the resistant portion of an old peneplain and now forms a prominent cuesta form ridge that has been modified by erosion along lines of faulting and by glacial scour. The White Hills in the south-central part of the Peninsula rise 270-335 m above sea level, and a prominent hill, Round Head, on the northwest side, rises abruptly to an elevation of more than 244 m.

The gently sloping and rolling lowlands on the more easily eroded sandstones and shales on the north, northeast, and northwest sides of the Peninsula are, in part, covered by glacial moraine and generally are heavily wooded or swampy. Elevations here range from sea level to about 76 m.

Long Point, extending northeastward from Round Head for about 29 km, forms a narrow, fingerlike projection, and is a cuesta underlain by limestone and sandstone. It has an elevation of nearly 122 m at the southeast end. Shoal Point, which extends north from the Peninsula for about 13 km, is thickly covered with peat and clay and underlain by sandstone and shale.

Streams are numerous but small. Those that drain down the dipslope to the north are larger, including Harry Brook and Victors Brook, which carry enough water during spring thaws to float pulpwood and timber. Those that flow south are smaller and generally shorter than the north-flowing streams and are intermittent. They have cut deep gullies into the cuesta face. Their valleys reflect the underlying rock structure and in most cases, they have been developed along fault lines or minor dislocations, or along zones of weakness.

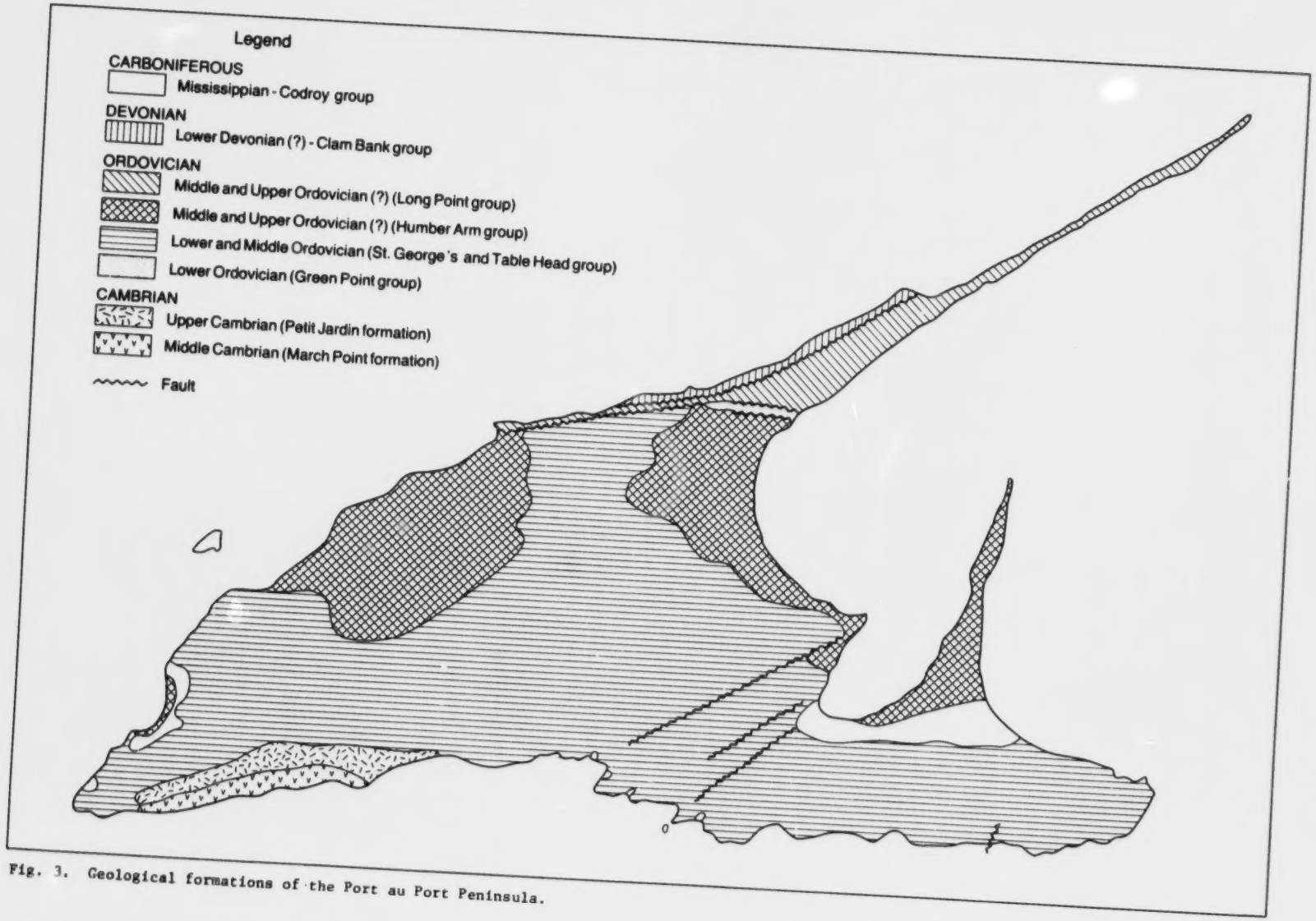
Legend
CARBONIFEROUS
Mississippian - Codroy group
DEVONIAN
Lower Devonian (?) - Clam Bank group
ORDOVICIAN
Middle and Upper Ordovician (?) (Long Point group)
Middle and Upper Ordovician (?) (Humber Arm group)
Lower and Middle Ordovician (St. George 's and Table Head group)
Lower Ordovician (Green Point group)
CAMBRIAN
Upper Cambrian (Petit Jardin formation)
Middle Cambrian (March Point formation)
Fault
LRRI

Fig. 3. Geological formations of the Port au Port Peninsula.

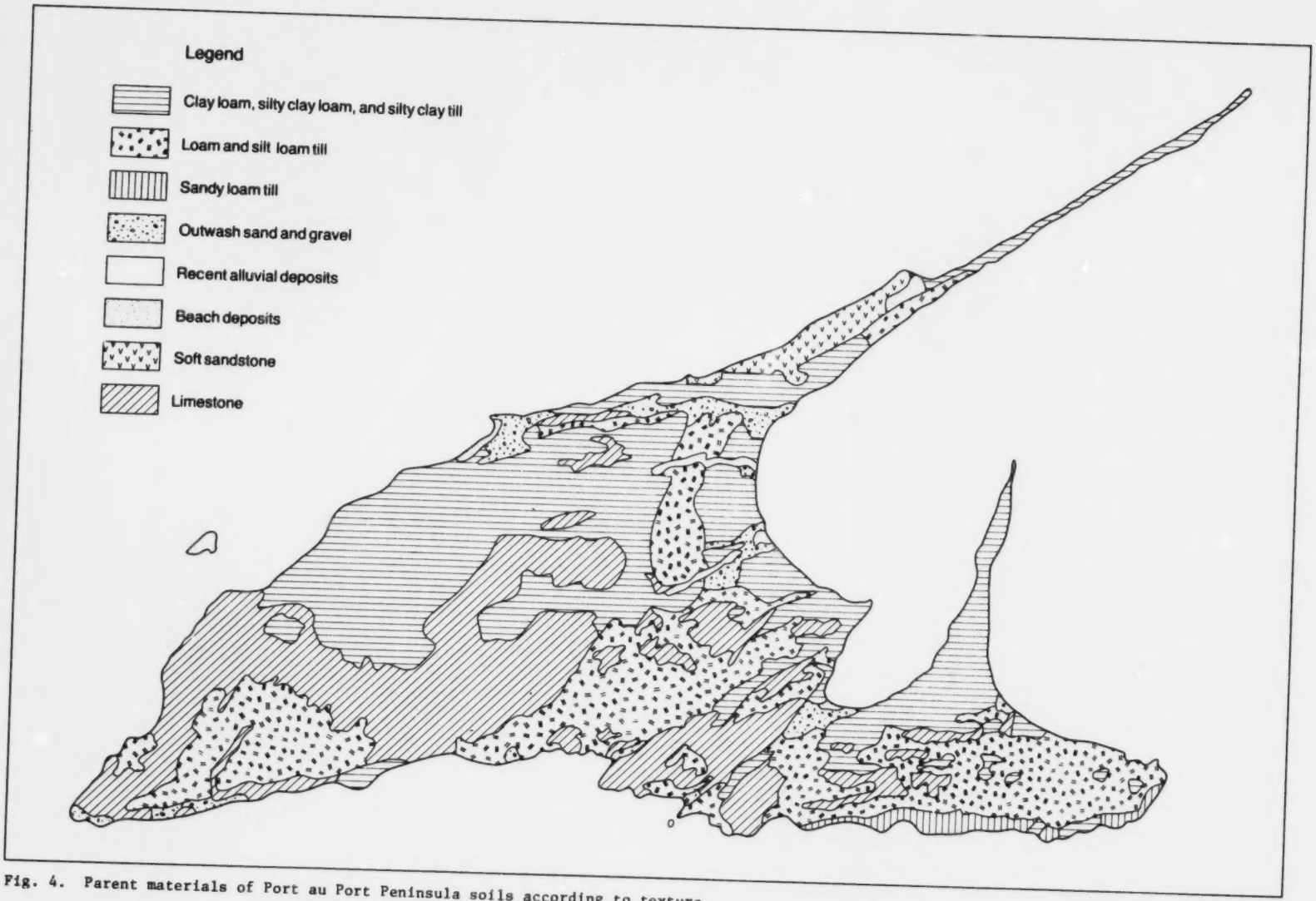

Fig. 4. Parent materials of Port au Port Peninsula soils according to texture.

SOIL DEVELOPMENT

On the Port au Port Peninsula, soil-forming factors have been at work since the melting of the ice sheet about 10 000 years ago. Under the influence of various factors, soluble salts and fine clay particles are leached downward and are either deposited at lower depths or removed in drainage water. The result is the formation of layers, or horizons, parallel to the earth's surface, that differ in physical characteristics and chemical composition. A vertical section through these layers is called the soil profile.

The upper part of the profile, or A horizon, consists of a layer or layers from which material has been removed or leached. It is underlain by the B horizon, in which materials from the A horizon have accumulated. The C horizon, underlying the B, is comparatively unweathered material similar to that from which the upper horizons have developed. Subdivisions may be made within each horizon according to observable differences in characteristics.

The effects of the soil-forming factors are most strongly evident in soils that are developed in well-drained, moderately coarse-textured parent materials. On the Port au Port Peninsula one group of soils has a thin surface horizon of partly decomposed organic matter (L, F, H). The A horizon (Ae) is a bleached, light-colored layer from which bases, iron, and aluminum compounds have been removed. The underlying B horizon, which has an abrupt upper boundary with the Ae, is usually reddish brown to black and becomes yellower in hue and lower in chroma as it grades into the C horizon. It contains the materials leached from the A horizon. The C horizon is more firm and dense than the A or B horizons. Soils that have these characteristics are known as Podzols. A large group of Podzols can be found on the Port au Port Peninsula.

In another group of soils in the area, the clay has been removed from the bleached Ae horizon together with salts and bases, and iron and aluminum compounds. The B horizon is darker in color and higher in clay and bases than the A horizon. If clay is the main accumulated product in this horizon, it will be designated as a Bt horizon. The Ae horizon is generally soft and friable, whereas the Bt horizon is firmer and usually has a blocky structure. These soils are called Luvisols.

Another group of soils on the Peninsula has poor drainage and a consequent lack of aeration, which restricts development. These soils are usually found at the foot of slopes, on low-lying land, or on nearly level land where a compact subsoil restricts the downward movement of water. They differ from the

well-drained Podzol soils in certain characteristics. Usually, the surface L-H horizon is thicker and contains more organic matter. The profile colors have low chroma, or there are distinct to prominent mottles of high chroma within 50 cm of the surface because of the reduction of the iron compounds in the presence of organic matter. This reduction process is called gleying. Soils with these characteristics are called Gleysols.

There are some areas on the Peninsula where the soils lack the degree or kind of horizon development found in other soils of the map area. They are well to imperfectly drained, and may have both Ae horizons and weakly expressed B horizons of accumulation of either clay (Btj) or aluminum and iron compounds (Bfj), or both. These soils are called Brunisols. The degree of horizon development is sufficient to separate them from the Regosol soils, which lack a horizon development.

Along the stream courses throughout the Peninsula, sediments have been deposited on flood plains. These are immature soils that lack horizon development because they have not been exposed to the action of the soil-forming factors for sufficient time. They are known as Regosol soils.

Organic deposits comprise another group of soils found on the Port au Port Peninsula. They occupy depressional areas and places where the soil is saturated with water during most of the year. These soils, known as Organic, consist of successive layers of organic material, mainly mosses and sedges, in various stages of decomposition from the surface downward.

HOW THE SOILS WERE MAPPED AND CLASSIFIED

The soil profiles of pits dug in fields and forested areas and of roadside exposures around the coast of the Peninsula were examined. The soils were examined near all roads and trails and near numerous cut lines through the forest. The boundaries between the various soils were plotted on aerial photographs with a scale of four inches to one mile and were then transferred to base maps with a scale of 1:50 000. Differences in slope and stoniness were recorded for each soil. Notes were taken on the vegetation and present land use.

At the end of the survey, samples were taken of the major soils for physical and chemical analyses. These analyses are given in the section entitled "Physical and chemical composition of the soils."

The principal mapping component used in the survey was the taxonomic soil series. A soil series is a group of soils that have soil horizons that are similar in physical and chemical properties and arrangement in the soil profile, and that have

Table 3. Classification of the soils of the Port au Port Peninsula

Order	Great group	Subgroup	Series or map unit name
Podzolic	**Humo-Ferric Podzol**	**Orthic Humo-Ferric Podzol**	
The well to imperfectly drained soils of this order have podzolic B horizons in which the dominant accumulation product is amorphous material composed mainly of humified organic matter combined in varying degrees with Al and Fe. Typically the soils occur in coarse to medium-textured acid parent materials, under forest or heath vegetation, in cool to very cold, humid to perhumid climates.	Humo-Ferric Podzols have a podzolic B horizon at least 10 cm thick. The B horizon may include a thin Bhf subhorizon, but usually it is a Bf horizon only. A Bf horizon contains 0.5-5% organic C and 0.6% or more pyrophosphate extractable Al+Fe (0.4% in sands).	Profile type: LFH, Ae, Bf, BC, C.	Port au Port Costa Lourdes West Bay Black Duck Brook
		Sombric Humo-Ferric Podzol	
		Profile type: LFH, Ah, Ae, Bf, BC, C. These soils differ from the Orthic subgroup by having an Ah horizon at least 10 cm thick.	Lead
		Gleyed Humo-Ferric Podzol	
		Profile type: LFH or O, Aegj, Bfgj, BCg, Cg. These soils differ from the Orthic subgroup by having distinct or prominent mottles within 1 m of the surface.	Long Point Tea Cove
Brunisolic	**Dystric Brunisol**	**Eluviated Dystric Brunisol**	
The well to imperfectly drained soils of this order have sufficient development to exclude them from the Regosolic order, but they lack the degree or kind of horizon development specified for soils of other orders. The central concept of the order is that of soils under forest that have brownish colored Bm horizons, but the order also includes soils of various colors with both Ae horizons and weakly expressed B horizons of accumulation of either clay (Btj) or amorphous Al and Fe compounds (Bfj), or both. Soils that have a Bf horizon less than 10 cm thick are a part of this order.	Dystric Brunisols lack a well-developed mineral-organic surface horizon. They have a Bm, Bfj, thin Bf, or Btj horizon at least 5 cm thick and a pH (0.01 M $CaCl_2$) of less than 5.5 throughout the upper 25 cm of the B horizon, or throughout the B horizon and the underlying material to a total depth of at least 25 cm or to a lithic contact above this depth.	Profile type: LFH, Ae or Aej, Bm or Bfj, C. These soils differ from the Orthic subgroup in that they have an eluvial horizon Ae or Aej at least 2 cm thick. The underlying horizon is commonly a Bfj, but it may be a Btj or a Bm.	Abraham Winterhouse

Table 3. Classification of the soils of the Port au Port Peninsula

Order	Great group	Subgroup	Series or map unit name
Luvisolic	Gray Luvisol	Orthic Gray Luvisol	
The well to imperfectly drained soils of this order generally have light colored eluvial horizons and illuvial B horizons in which silicate clay has accumulated. Typically the soils occur in sandy loam to clay, base-saturated parent materials under forest vegetation in subhumid to humid, mild to very cold climates.	Gray Luvisols have eluvial and Bt horizons. They usually have L, F, and H horizons and may have a degraded Ah or Ahe horizon similar to the upper A horizon of the Dark Gray Chernozemic soils. Commonly the ped surfaces are grayer than the interior of the peds. The solum is generally slightly to moderately acid. The degree of base saturation is generally high.	Profile type: LFH, Ae, AB, Bt, C or Ck.	Round Head Hardwood
		Gleyed Gray Luvisol	
		Profile type: LFH, Ae, Btgj, Cg. These soils differ from the Orthic subgroup by having either distinct mottles indicative of gleying within 50 cm of the mineral surface, or prominent mottles at depths of 50 to 100 cm.	Boswarlos Crow Head Victors Brook
Regosolic	Regosol	Orthic Regosol	
The soils of this order have too weak a horizon development to meet the requirements of any other order.	These Regosols do not have an Ah horizon at least 10 cm thick at the mineral surface. They may have buried mineral-organic layers and organic surface horizons, but no B horizon at least 5 cm thick.	Profile type: C.	Three Rock Cove
Gleysolic	Gleysol	Orthic Gleysol	
The soils of this order have features that are indicative of periodic or prolonged saturation with water, and reducing conditions. The soils have within 50 cm of the surface either matrix colcors of low chroma or distinct to prominent mottles of high chroma, which are indicative of localized oxidation of ferrous iron and deposition of hydrated ferric oxides.	These Gleysols lack an Ah horizon more than 10 cm thick, a mixed surface horizon (Ap) at least 15 cm thick, and a Bt horizon. They have a gleyed B or C horizon and they may have an organic surface horizon.	Profile type: LFH or O, Bg, Cg.	Shoal Point Belman Piccadilly Salmon Cove
	Luvic Gleysol	Fera Luvic Gleysol	
	Luvic Gleysols have a horizon of clay accumulation (Btg). A Btg horizon is defined on the basis of an increase in clay over that in the A horizon, the presence of clay skins, and colors and mottling that are indicative of permanent or periodic reduction. They may have an organic surface horizon and an Ah horizon.	Profile type: LFH or O, Ah, Aeg, Bgf, Btg, Cg. This subgroup differs from the Orthic Luvic Gleysols by having either a Bgf at least 5 cm thick in addition to a Btg horizon, or a Btgf horizon. They may have an Ah or Ap horizon that meets the requirements for a Humic Luvic Gleysol.	Aguathuna Mainland

Table 3. Classification of the soils of the Port au Port Peninsula

Order	Great group	Subgroup	Series or map unit name
Organic	Fibrisol	Typic Fibrisol	
The soils of this order are composed mainly of organic materials. Most organic soils are saturated with water for prolonged periods. These soils contain more than 17% organic C by weight.	Fibrisols are composed mainly of relatively undecomposed fibric organic material. They have a dominantly fibric middle tier or middle and surface tiers if a terric, lithic, or hydric contact occurs in the middle tier.	Profile type: Of or Om, Of. If present, the middle and bottom tiers are dominantly fibric. A lithic contact may occur.	Clam Bank Cove
		Mesic Fibrisol	
		Profile type: Of or Om, Of, Om, Of. These soils have a subdominant mesic layer, thicker than 25 cm in the middle or bottom tier.	Pigeon Head Sheaves Cove
		Terric Fibrisol	
		Profile type: Of or Om, Of, C. These soils have an unconsolidated layer of mineral soil at least 30 cm thick beneath the surface tier.	Ship Cove
	Mesisol	Typic Mesisol	
	Mesisols are at a stage of decomposition between Fibrisols and Humisols. They have a dominantly mesic middle tier or middle and surface tiers if a terric, lithic, or hydric contact occurs in the middle tier.	Profile type: Of, Om, or Oh, Om. If present, the middle and bottom tiers are dominantly mesic. A lithic contact may occur.	Felix Cove Marches Point
		Humic Mesisol	
		Profile type: Of, Om or Oh, Om, Oh, Om. These soils have a subdominant humic layer thicker than 25 cm in the middle or bottom tiers and they may also have a subdominant fibric layer.	Red Island
		Terric Mesisol	
		Profile type: Of, Om or Oh, Om, C, Om. These soils have a terric layer beneath the surface tier.	Campbells Cove

Table 3. Classification of the soils of the Port au Port Peninsula

Order	Great group	Subgroup	Series or map unit name
	Humisol	Terric Humisol	
	Humisols are at the most advanced stage of decomposition of the great groups of Organic soils. They have a dominantly humic middle tier or a middle and surface tier if a terric, lithic, or hydric contact occurs in the middle tier.	Profile type: Om or Oh, Oh, C, Oh. The soils have an unconsolidated mineral substratum at least 30 cm thick beneath the surface tier.	Big Cove Jerrys Nose
		Typic Humisol	
		Profile type: Om or Oh, Oh. If present, the middle and bottom tiers are dominantly humic. A lithic contact may occur.	Cointres Brook

Table 4 Classification of the soils by parent material and soil development

Parent material	Soil development	Series or map unit
Silty clay till	Eluviated Dystric Brunisol	Abraham
	Orthic Gleysol	Shoal Point
	Fera Luvic Gleysol	Aguathuna
Clay loam till	Gleyed Gray Luvisol	Boswarlos
	Orthic Gleysol	Belman
Silty clay loam till	Gleyed Humo-Ferric Podzol	Long Point
	Orthic Gray Luvisol	Round Head
Clay loam or silty clay loam till	Orthic Gray Luvisol	Hardwood
	Gleyed Gray Luvisol	Crow Head
		Victors Brook
	Orthic Gleysol	Piccadilly
	Fera Luvic Gleysol	Mainland
Loam or silt loam till	Orthic Humo-Ferric Podzol	Port-au-Port
		Costa
Loam till	Orthic Humo-Ferric Podzol	Lourdes
Sandy loam till	Sombric Humo-Ferric Podzol	Lead
	Eluviated Dystric Brunisol	Winterhouse
Sandy loam alluvium	Orthic Humo-Ferric Podzol	West Bay
	Gleyed Humo-Ferric Podzol	Salmon Cove
		Tea Cove
Gravelly marine	Orthic Humo-Ferric Podzol	Black Duck Brook
	Orthic Regosol	Three Rock Cove
		Coastal Beach
Thin organic deposit over mineral material	Terric Fibrisol	Ship Cove
	Terric Mesisol	Campbells Cove
	Terric Humisol	Big Cove
		Jerrys Nose
Thick organic deposit	Typic Fibrisol	Clam Bank Cove
	Mesic Fibrisol	Pigeon Head
	Typic Mesisol	Sheaves Cove
		Felix Cove
	Humic Mesisol	Marches Point
	Typic Humisol	Red Island
		Cointres Brook

been developed from a parent material that has particular properties. Each soil series is designated by place names or geographical features that usually give some indication of the area where the soil was first described and mapped. Individual soils usually do not occupy large continuous areas, but are associated with other soils in a complex landscape pattern. At the scale of mapping, it was impractical to separate closely related soils in areas of complex landscapes. Hence, the mapping units usually consist of two or more major soils in a soil complex.

The soils were classified according to the Canadian system of soil classification (Canada Soil Survey Committee 1978) as presented in Table 3. The relationship between the various parent materials and soil development is shown in Table 4. The major differences in the soils are associated with differences in the texture and composition of the parent material. The soils differ in characteristics produced, depending on the degree of drainage.

DESCRIPTION OF THE SOIL MAP UNITS

The soil map units, named for the dominant soil series in each unit, are described here. Most of the map units shown on the map have one symbol in the numerator and three in the denominator, e.g.,

$$\frac{R}{FOR4}$$

The symbol in the numerator refers to the dominant soil series described in the section that follows.

Other map units have two or three symbols in the numerator, e.g.,

$$\frac{Ab\text{-}Bt}{E2\ R2} \quad \text{or} \quad \frac{Ab\text{-}Ca\text{-}Ag}{f3R1}$$

In such map units the first symbol represents the dominant or most abundant soil in the delineation, whereas the second and third ones represent subdominant and minor but significant ones, respectively.

The denominator symbols refer to the average topography, stoniness, and rockiness in the map unit.

The descriptions of the soils include the general location and area, parent materials, topography, drainage, vegetation, soil classification, and land use.

ABRAHAM MAP UNIT 3306 ha

Location. Large areas of Abraham soils are found south of Round Head and east of Mainland. Smaller areas occur east and west of Piccadilly.

Parent material. The Abraham soils have developed on a brown silty clay to clay till derived from dolomite, marble, slate, limestone, and chert.

Topography. The soils occupy moderately to steeply sloping terrain.

Drainage. The Abraham soils are slowly permeable to water, but are moderately well drained.

Vegetation. The main vegetation is balsam fir and white spruce mixed with smaller amounts of white birch and pin cherry. The understory vegetation is mainly ferns. The wild red raspberry grows profusely in cut-over places.

Soil classification. Eluviated Eutric Brunisol.

Description of a representative profile.

Horizon	Depth (cm)	Description
F	13-0	Very dark brown (10YR 2/2 m), very dark grayish brown (10YR 3/2 d) semidecomposed organic matter; fibrous; plentiful, very fine to medium horizontal and oblique roots; abrupt, smooth boundary; 10-15 cm thick; extremely acid.
Ae	0-3	Very pale brown (10YR 7/4 m, 8/4 d) clay; moderate, medium platy; firm; abundant, coarse roots; clear, wavy boundary; 1-4 cm thick; extremely acid.
Bm1	3-11	Reddish yellow (7.5YR 6/6 m), pink (7.5YR 7/4 d) silty clay; weak, medium platy to moderate, medium blocky; very firm; coarse to fine roots; gradual, wavy boundary; 10-15 cm thick; extremely acid.
Bm2	11-25	Light yellowish brown (10YR 6/4 m), very pale brown (10YR 7/4 d) silty clay; moderate, medium blocky; firm; few fine to very fine roots; gradual, wavy boundary; 12-30 cm thick; extremely acid.
Ck	25-45	Brown (10YR 5/3 m), very pale brown (10YR 7/4 d) silty clay; massive, breaking to weak, medium subangular blocky; firm; few fine and very fine roots; abrupt, irregular boundary; 5-50 cm thick; neutral.

R	45+	Limestone.

Range in characteristics. The till is seldom more than 50 cm thick, and numerous limestone and dolomite outcrops are present. The land is moderately stony and very to extremely rocky. These soils are very similar to the Boswarlos soils in texture, structure, and drainage.

Land use. The use of the Abraham soils is limited by shallowness to bedrock (Canada Land Inventory, Subclass R), steep slopes (T), and stoniness (P). They are generally unsuitable for crops (Canada Land Inventory, Class 5), but support a good forest stand. A very stony and rocky area south of Round Head could be used for pasture if it were cleared, limed, fertilized, and seeded to grass. The Abraham soils occupy about 8.7% of the Peninsula.

AGUATHUNA MAP UNIT 1060 ha

Location. The soils occur in various locations scattered over most of the Peninsula.

Parent material. The Aguathuna soils have developed on a grayish brown clay loam till developed from shale, limestone, graywacke, and conglomerate. Limestone occurs more than 90 cm from the surface but is occasionally within 50 cm.

Topography. The soils occupy gently sloping to depressional areas.

Drainage. The position of these soils in the landscape and the fine-textured parent material keep the water table near the surface most of the year. Consequently, the soils are poorly drained.

Vegetation. The tree cover consists of scattered, dwarf black spruce, balsam fir, and larch. The ground cover is sphagnum moss, sheep-laurel, Labrador-tea, and blueberry.

Soil classification. Fera Luvic Gleysol.

Description of a representative profile.

Horizon	Depth (cm)	Description
Of	20-15	Undecomposed sphagnum moss; gradual, smooth boundary; 2-13 cm thick; extremely acid.
Om	15-0	Semidecomposed sphagnum moss; abrupt, smooth boundary; 12-33 cm thick; extremely acid.
Aeg	0-8	Light brownish gray (10YR 6/2 m), light gray (10YR 7/2 d) clay loam; moderate, medium

		platy; slightly sticky, slightly plastic; clear, wavy boundary; 5-10 cm thick; extremely acid.
Btgf	8-20	Brown (10YR 5/3 m), brownish yellow (10YR 6/6 d) clay; many medium, prominent, brownish yellow (10YR 6/8 m) mottles; amorphous; very sticky, very plastic; gradual, wavy boundary; 7-18 cm thick; extremely acid.
Cg	20-56	Grayish brown (2.5Y 5/2 m), pale yellow (2.5Y 7/4 d) clay loam; amorphous; sticky, plastic; clear, wavy boundary; 25-40 cm thick; medium acid.
Ckg	56+	Grayish brown (2.5Y 5/2 m), pale yellow (2.5Y 7/4 d) clay loam; amorphous; sticky, plastic; neutral.

Range in characteristics. The soils are moderately stony throughout the profile, but surface stoniness is concealed by the thick organic surface layer. The Btgf horizon is usually finer textured than the other horizons. The pH values are generally high in the parent material because of the underlying limestone. The Aguathuna soils are associated with the Port au Port, Costa, and Abraham soils.

Land use. The Aguathuna soils occupy about 2.8% of the area. They have no agricultural value (Class 7) because of their very low fertility and poor drainage (W). The surface peaty layers, which vary greatly in thickness and impart a hummocky micro-relief, together with an abundance of woody and ericaceous shrubs, would make them difficult to cultivate. The natural vegetation is unsuitable for pasture, but blueberries grow profusely on the Aguathuna soils.

BELMAN MAP UNIT 692 ha

Location. The soils are found throughout the area at the foot of slopes and in low-lying positions.

Parent material. The Belman soils have developed on a light brown clay loam till derived from dolomite, limestone, marble, shale, and chert deposited over limestone and dolomite.

Topography. The soils occupy moderately sloping to depressional terrain.

Drainage. The Belman soils are poorly drained.

Vegetation. The tree cover consists of scattered black spruce, larch, and balsam fir and, occasionally, white spruce, white birch, mountain maple, mountain ash, and pin cherry. The understory includes horsetail, ferns, sedge, burnet, and sheep-laurel.

Soil classification. Orthic Gleysol.

Description of a representative profile.

Horizon	Depth (cm)	Description
L-H	20-0	Black (10YR 2/1 m), very dark grayish brown (10YR 3/2 d) semidecomposed organic matter; fibrous to greasy; abrupt, smooth boundary; 7-35 cm thick; extremely acid.
Aeg	0-4	Light gray (10YR 7/2 m, d) clay loam; strong, fine platy; friable; clear, wavy boundary; 0-5 cm thick; extremely acid.
Bg	4-27	Brown (10YR 5/3 m), light yellowish brown (10YR 6/4 d) clay loam; many medium and coarse, prominent, yellowish red (5YR 5/8 m) mottles; amorphous; sticky, plastic; gradual, wavy boundary; 12-30 cm thick; extremely acid.
Cg	27+	Brown (10YR 5/3 m), light yellowish brown (10YR 6/4 d) clay loam; amorphous; very sticky, very plastic; slightly acid.

Range in characteristics. The Belman soils are usually fine-textured, but occasional sandy pockets are found. The soils are dense and compact. They are moderately stony, but the stones are usually not evident under the organic surface layer, which may be up to 35 cm thick. The poor drainage is reflected in the sparse forest cover.

Land use. Belman soils occupy nearly 2% of the Peninsula. Their use for crops is restricted by poor drainage (W). When cleared, limed, fertilized, and seeded to hay, they are suitable for pasture (Class 5).

BIG COVE MAP UNIT 431 ha

Location. The organic soils occur on the west coast of the Peninsula near Crow Head.

Parent material. Big Cove soils are composed of moss, woody material, and some partly decomposed sedges.

Topography. The bowl bogs originally formed in depressions on gently sloping topography; the surface is gently undulating with small hummocks.

Drainage. Poor.

Vegetation. Mainly sphagnum moss with stunted black spruce and a general, open ground cover of sheep-laurel, Labrador-tea, and baked-apple.

Soil classification. More than 80% Terric Humisol.

Description. The soils have at the surface a thin (10 cm) layer consisting mainly of undecomposed moss and roots. At greater depth they have a thin, poorly decomposed (mesic) layer of moss, sedges, and roots, which is underlain by well-decomposed organic material, generally with remains of big roots and tree stumps. Mineral soil is found at a depth of 70-130 cm.

Use Potential. The soils might be developed for tree growing.

BLACK DUCK BROOK MAP UNIT 105 ha

Location. The soils are found only at the northern end of the wide portion of Long Point.

Parent material. The Black Duck Brook soils have developed on dark grayish brown gravelly and sandy beach sediments.

Topography. The topography is gently undulating to undulating.

Drainage. There is a high water table in these soils, but little mottling in the profile. The soils may be regarded as only slightly imperfectly drained.

Vegetation. The tree cover is mainly balsam fir, black spruce, white spruce, and alder. Raspberries and timothy grow in cut-over areas.

Soil classification. Orthic Humo-Ferric Podzol.

Description of a representative profile.

Horizon	Depth (cm)	Description
L	8-6	Undecomposed organic matter; plentiful, very fine to medium horizontal roots; clear, smooth boundary; 1-3 cm thick; extremely acid.
F	6-3	Semidecomposed organic matter; fibrous; clear, smooth boundary; 2-8 cm thick; extremely acid.
H	3-0	Black (2.5YR 2/0 m), dark reddish brown (5YR 3/3 d) well-decomposed organic matter; greasy; clear, wavy boundary; 2-5 cm thick; extremely acid.
Ae	0-20	Pinkish gray (7.5YR 6/2 m), light brown (7.5YR 6/4 d) sandy loam; single grain; loose; numerous sandstone and granite pebbles in laminar alignment; clear, wavy boundary; 15-26 cm thick; extremely acid.
Bf	20-38	Yellowish red (5YR 4/8 m, 5/6 d) sandy loam; single grain; loose; sandstone and granite

		pebbles in laminar alignment; closely packed; gradual, wavy boundary; 15-20 cm thick; extremely acid.
C	38-56	Dark grayish brown (10YR 4/2 m), yellowish brown (10YR 5/8 d) loamy sand; single grain; loose; sandstone and granite pebbles in laminar alignment; closely packed; clear, wavy boundary; 15-20 cm thick; extremely acid.
IIC	56+	Fine gravel; single grain; loose; water table at 66 cm.

Range in characteristics. The Black Duck Brook soils have developed in a series of raised beaches. The soils are very stony and become coarser textured with depth. The high water table is probably caused by an adjacent bog and by the relatively low position of these soils in the landscape.

Land use. The soils occupy only 0.3% of the Peninsula. The limitations to agriculture (Classes 5-7) are high acidity and low fertility (F), stoniness (P), and somewhat imperfect drainage (W). These soils could be used for pasture when cleared, limed, fertilized, and seeded to grass. They support a good forest stand.

BOSWARLOS MAP UNIT 344 ha

Location. The soils occur in two areas on the Peninsula--one at Boswarlos and the other northeast of Lourdes.

Parent material. The Boswarlos soils have developed on a dark grayish brown clay loam to silty clay till derived from dolomite, limestone, marble, shale, and chert.

Topography. The soils occupy moderately to strongly rolling topography.

Drainage. Surface drainage is good, but the soils are somewhat imperfectly drained in the subsoil.

Vegetation. The main trees are balsam fir, with a few black spruce, white spruce, mountain maple, white birch, mountain ash, dogwood, wild raisin, and occasionally, alder. Juniper, yew, and bunchberry form the understory.

Soil classification. Gleyed Gray Luvisol.

Description of a representative profile.

Horizon	Depth (cm)	Description
L-H	4-0	Black (10YR 2/1 m), semidecomposed organic matter; plentiful, fine, medium, and coarse

		horizontal roots; abrupt, smooth boundary; 2-8 cm thick.
Ae	0-3	Pinkish gray (7.5YR 5/2 m), pinkish white (7.5YR 8/2 d) loam; amorphous; firm; plentiful, very fine to medium random roots; clear, wavy boundary; 1-5 cm thick; extremely acid.
Btg1	3-10	Dark brown (7.5YR 4/2 m), pink (7.5YR 7/4 d) clay loam; many fine and medium, prominent, strong, brown (7.5YR 5/8 m) mottles; moderate, medium, subangular blocky; firm; plentiful, very fine to medium random roots; some pockets of Ae; clear, smooth boundary; 5-10 cm thick; extremely acid.
Btg2	10-30	Brown (7.5YR 5/2 m), light brown (7.5YR 6/4 d) clay loam; common, fine, prominent, yellowish brown (7.5YR 5/6 m) mottles; strong, coarse blocky; very firm; few very fine to medium vertical roots; clear, wavy boundary; 18-30 cm thick; extremely acid.
BC	30-76	Dark grayish brown (10YR 4/2 m), light yellowish brown (10YR 6/4 d) clay loam; amorphous; very firm; very few very fine oblique roots; abrupt, smooth boundary; 25-50 cm thick; medium acid.
Cca	76+	Dark grayish brown (10YR 4/2 m), light yellowish brown (10YR 6/4 d) clay loam; amorphous; firm; neutral.

Range in characteristics. The soils are uniformly fine-textured throughout their profiles and are fairly dense and compact. There are occasional limestone or dolomite outcrops, and the land is very stony.

Land use. The Boswarlos soils occupy only 0.9% of the Peninsula. Their use for agriculture (Classes 5-7) is restricted by topography (T), stoniness (P), and adverse subsoil structure (D). The area northeast of Lourdes could be improved for pasture by clearing, liming, fertilizing, and seeding to grass. The area near Boswarlos, if cleared, could be used for vegetable growing, but care must be taken to prevent water erosion. This soil is only slowly permeable to water and requires cultivation at the proper moisture content to maintain good tilth. It needs regular applications of lime and heavy applications of fertilizer. These soils also support a good forest.

CAMPBELLS COVE MAP UNIT 421 ha

Location. The organic soils occur mainly on the northern part of the Peninsula and south of The Bar.

Parent material. The soils are composed of residues of sphagnum and other mosses with some cotton-grass. Woody material is common in the lower layer.

Topography. The sloping bogs have very gentle slopes and are situated in depressions of gently sloping to gently rolling topography.

Drainage. Very poor.

Vegetation. Scattered stunted black spruce and larch grow on the edge. Small shrubs such as sheep-laurel and Labrador-tea grow in some areas, with a ground vegetation of cotton-grass, some sphagnum moss, and baked-apple.

Soil classification. More than 80% Terric Mesisol.

Description. The soils have a surface layer of partly decomposed roots, cotton-grass, and moss ranging from 60 to 120 cm deep. This is underlain by a well-decomposed layer of 15-20 cm over mineral soil.

Use potential. The soils could be considered for tree growing.

CLAM BANK COVE MAP UNIT 756 ha

Location. The organic soils occur mainly on the land tip between East Bay and West Bay and in some small scattered locations in the eastern half of the Peninsula.

Parent material. The domed bogs are composed mainly of relatively undecomposed sphagnum moss, with a little cotton-grass and some woody material.

Topography. The soils occupy depressions in gently sloping topography, where moisture is plentiful most of the year.

Drainage. Drainage is very poor and mud ponds within the organic soils are common.

Vegetation. Low shrubs such as sheep-laurel, as well as blueberry and Labrador-tea, are common, with very few scattered stunted black spruce in some locations over a surface vegetation of sphagnum moss.

Soil classification. More than 80% Typic Fibrisol.

Description. The soils consist mainly of relatively undecomposed (fibric) sphagnum moss more than 160 cm deep. Thin lenses of slightly more decomposed (mesic) moss is common in the lower part of the profile.

Use potential. The soils could be considered for the production of horticultural peat moss.

COASTAL BEACH MAP UNIT 54 ha

Along the coastline of the Peninsula there are deposits of wave-washed beaches. They are composed of gray sand and gravel, with deposits of coarse, cobbly gravel on the landward side.

They have no agricultural value (Class 7), and none is extensive enough to have recreational value.

COINTRES BROOK MAP UNIT 597 ha

Location. The organic soils occur in the western area of the Peninsula, south of Three Rock Cove.

Parent material. Cointres Brook soils have developed from sedges, grass, herbaceous plants, and moss; the residues are well decomposed and generally not recognizable by visual observation.

Topography. The bogs occur on slopes exposed to winds from the sea and are fed by water from higher elevations on the gentle slopes.

Drainage. Very poorly drained.

Vegetation. The soils support open larch stands, with occasional black spruce, bog-rosemary, baked-apple, and moss, with an abundance of cotton-grass.

Soil classification. More than 80% Typic Humisol.

Description. A thin surface horizon of this organic soil consists of undecomposed sedge, shrub, and grass. This is underlain by a layer 50 cm thick, of partly decomposed plant remains, which is underlain by well-decomposed organic muck, generally to a depth of 160-250 cm.

Use potential. The soils could be considered for fuel peat production or tree production after drainage.

COSTA MAP UNIT 4075 ha

Location. The soils are common throughout most of the southern part of the Peninsula.

Parent material. The soils are developed in a reddish yellow to yellowish brown silt loam till derived from dolomite, marble, shale, and chert.

Topography. The Costa soils have a gently rolling to hilly topography.

Drainage. The soils are moderately well to imperfectly drained.

Vegetation. The main tree cover is balsam fir, black spruce, white spruce, mountain maple, mountain ash, and pin cherry. The ground cover consists of ferns, plume moss, horsetail, yew, and sheep-laurel.

Soil classification. Orthic Humo-Ferric Podzol.

Description of a representative profile.

Horizon	Depth (cm)	Description
L-H	10-0	Black (10YR 2/1 m), semidecomposed organic matter; fibrous; greasy; abundant, very fine to medium horizontal roots; abrupt, wavy boundary; 5-13 cm thick.
Ae	0-8	Light gray (10YR 7/1 m), very pale brown (10YR 7/3 d) silt loam; moderate, medium platy; very firm; few very fine to medium random roots; clear, irregular boundary; 1-8 cm thick; extremely acid.
Bf1	8-13	Yellowish red (5YR 5/8 m), reddish yellow (7.5YR 7/6 d), and numerous pockets of red (2.5YR 5/8 m) clay loam; amorphous, breaks to strong, medium platy; few very fine to medium random roots; numerous pockets of Ae; clear, irregular boundary; 5-15 cm thick; extremely acid.
Bf2	13-28	Reddish brown (5YR 5/4 m), reddish yellow (5YR 6/6 d) loam; amorphous, breaks to moderate, medium granular; very friable; very few very fine to medium random roots; gradual, irregular boundary; 7-20 cm thick; extremely acid.
Bf3	28-53	Reddish brown (2.5YR 4/4 m, 5/4 d) silt loam; amorphous, breaks to moderate, medium granular; very friable; very few very fine to medium random roots; clear, wavy boundary; 15-30 cm thick; extremely acid.
C	53+	Reddish yellow (7.5YR 6/6 m, d) silt loam; amorphous, breaking to moderate, medium granular; very friable; very few very fine to medium random roots; very strongly acid.

Range in characteristics. The Costa soils are sometimes uniformly medium-textured, but more often, the texture becomes finer with depth. The profiles are slightly imperfectly drained and often contain numerous small limestone rocks. Limestone is usually found at 50-66 cm below the surface. The surface is moderately to very stony and rocky. The Costa soils are associated in the landscape with the Port au Port soils.

Land use. The Costa soils occupy about 10.6% of the Peninsula. They have little value for agriculture (Class 7) because of shallowness (R), excessive stoniness (P), and low natural fertility (F). They support a fair to very good stand of forest and are best suited for this purpose. They can be cleared, limed, fertilized, and seeded to grass and used for hay and pasture in some small areas where slopes are gentler and stones less common (Class 5).

CROW HEAD MAP UNIT 1400 ha

Location. The soils occur in the area between Three Rock Cove and Mainland.

Parent material. The Crow Head soils have developed on a light yellowish brown to brown silty clay loam to clay loam till. The till contains numerous small shale fragments and granitic pebbles, graywacke, conglomerate, and sandstone.

Topography. The topography is undulating to rolling.

Drainage. The profile is imperfectly drained and has distinct to prominent mottling within 10 cm of the surface.

Vegetation. The main tree cover is balsam fir, black spruce, white birch, mountain ash, and alder. The ground cover consists of ferns, sphagnum moss, plume moss, horsetail, bunchberry, yew, and juniper.

Soil classification. Gleyed Gray Luvisol.

Description of a representative profile.

Horizon	Depth (cm)	Description
L-H	4-0	Black (7.5YR 2/0 m), well-decomposed organic matter; greasy; abundant, very fine to medium horizontal and oblique roots; abrupt, smooth boundary; 2-8 cm thick.
Aegj	0-13	Pinkish gray (7.5YR 7/2 m), pinkish white (7.5YR 8/2 d) silty clay loam; many medium and coarse, distinct, light brown (7.5YR 6/4 m) mottles; moderate, medium platy; very firm; plentiful, very fine and fine oblique roots; clear, wavy boundary; 1-12 cm thick; extremely acid.
Aeg	13-23	Dark reddish brown (5YR 3/2 m), light brown (7.5YR 6/4 d) sandy clay loam; many fine, prominent, yellowish red (5YR 4/8 m) mottles; moderate, coarse, subangular blocky; firm; plentiful, very fine and fine random roots; abrupt, wavy boundary; 7-15 cm thick; extremely acid.
Btg1	23-33	Grayish brown (2.5Y 5/2 m), light yellowish brown (2.5Y 6/4 d) clay loam; many fine and medium prominent, yellowish brown (10YR 5/8 m) mottles; moderate, medium, and coarse, subangular blocky; friable; few very fine and fine oblique roots; numerous sandstone slabs; clear, wavy boundary; 7-15 cm thick; extremely acid.
Btg2	33-46	Greenish gray (5GY 6/1 m), very pale brown (10YR 7/3 d) silty clay loam; many fine, prominent, dark brown (10YR 4/3 m) mottles;

		massive, breaking to moderate and coarse, subangular blocky; firm; clear, wavy boundary; 7-15 cm thick; extremely acid.
Cg	46+	Brown (10YR 5/3 m), light yellowish brown (10YR 6/4 d) clay; massive, breaking to moderate, medium granular; friable; numerous small shale fragments; extremely acid.

Range in characteristics. The Crow Head soils are uniformly fine-textured. They are moderately to very stony, and some profiles contain numerous sandstone slabs. The till overlies sandstone at about 76 cm from the surface. The Crow Head soils are associated with the Round Head soils.

Land use. These soils support a moderately good stand of forest. They are limited for agricultural use (Class 5) by steep slopes (T), imperfect drainage (W), low fertility (F), and a slightly unfavorable subsoil structure (D). When cleared, the soils are suitable for pasture if lime and fertilizer are applied. They should not be worked when too wet. The Crow Head soils occupy about 3.6% of the Peninsula.

FELIX COVE MAP UNIT 331 ha

Location. The organic soils were mapped on several locations in the central part of the Peninsula.

Parent material. The soils are composed of residues of a variety of mainly sphagnum mosses, with some cotton-grass and cotton-grass roots. Chunks of woody material are common in the lower parts of these soils.

Topography. The horizontal bogs often occur in depressions in locations where moisture is plentiful most of the year.

Drainage. Poor.

Vegetation. Scattered stunted black spruce and larch grow on the edge. Small shrubs like sheep-laurel and Labrador-tea are fairly common. Ground cover consists mainly of sphagnum moss and cotton-grass, with some baked-apple and occasionally bog-rosemary.

Soil classification. More than 80% Typic Mesisol.

Description. These soils consist of relatively undecomposed surface moss between 20 and 30 cm thick underlain by partly decomposed (mesic) peat to a depth of 1.8 m or more. Thin well-decomposed peat several centimetres thick is common above the mineral soil. Woody material is often found at a depth of 80 cm or deeper.

Use potential. The soils could be considered for tree production if drained.

HARDWOOD MAP UNIT 1039 ha

Location. The soils occur in a north to south area about 2 miles west of West Bay and West Bay Centre.

Parent material. The Hardwood soils developed from a yellowish brown to grayish brown loamy glacial till derived from red, green, and black shale, limestone, graywacke, conglomerates, and sandstone.

Topography. The soils occupy gently to strongly rolling terrain.

Drainage. Hardwood soils are well drained.

Vegetation. Balsam fir and white birch are the main trees, with some mountain maple and mountain ash and an understory of ferns, horsetail, and plume moss.

Soil classification. More than 80% Orthic Gray Luvisols, lithic phase.

Description of a representative profile.

Horizon	Depth (cm)	Description
L-F	0-10	Black (10YR 2/1 m), very dark gray (10YR 3/1 d), semidecomposed organic matter; fibrous; plentiful, fine, medium, and coarse horizontal roots; abrupt, smooth boundary; 5-10 cm thick.
Ae	0-5	Light gray (10YR 6/1 m), white (10YR 8/2 d), loam; moderate, medium platy; friable; plentiful, fine to medium random roots; abrupt, wavy boundary; 1-6 cm thick; extremely acid.
Bt	5-20	Dark brown (7.5Y 4/2 m), light brown (7.5Y 6/4 d), clay loam; moderate, medium, subangular blocky; friable, common, thin clay coatings on ped faces; sandstone pockets and occasional small quartzite pebbles; plentiful, fine, oblique roots; clear, wavy boundary; 15-30 cm thick; extremely acid.
C	20-36	Yellowish brown (10YR 5/4 m), brownish yellow (10YR 6/4 d); loam; weak, fine, subangular blocky; friable; numerous sandstone fragments; few fine, oblique roots; clear, wavy boundary; 8-20 cm thick; strongly acid.
IIC	36+	Sandstone.

Range in characteristics. The Hardwood soils are moderately stony and slightly to moderately rocky. Stoniness increases with depth. These soils are generally underlain by sandstone rock at a depth of 30-50 cm.

Land use. Most of the Hardwood soils support fairly good tree growth. Their use for agriculture is limited (Class 5) because of shallow depth to bedrock (R), areas with steep slopes (T), high acidity and low fertility (F). Much of the Hardwood soils could be cleared and, with proper management, used for pasture (Class 5); the gentler slopes could be used for vegetable growing (Class 4).

JERRYS NOSE MAP UNIT 106 ha

Location. The organic soils occur near the west coast, northeast of Cape Cormorant.

Parent material. The organic materials are partly decomposed to decomposed residues of sphagnum and other mosses, sedges, and herbaceous plants.

Topography. The bowl bogs are developed in depressions in gently sloping topography.

Drainage. Very poor.

Vegetation. Sphagnum mosses, cotton-grass, baked-apple, and bog-rosemary are common, and small, scattered black spruce and larch occur on the edge.

Soil classification. More than 80% Terric Humisol.

Description. A surface horizon of relatively undecomposed fibric organic material 10-30 cm thick overlies partly decomposed (mesic) organic material to a depth of 50 cm. It overlies well-decomposed organic material to a depth of 120-150 cm, which rests on mineral soil.

Use potential. The soils could be considered for fuel peat production followed by tree production.

LEAD MAP UNIT 550 ha

Location. The soils occur in a narrow band along the south coast of the Peninsula, from Gravels Pond to Abrahams Cove.

Parent material. The Lead soils are developed in a brown sandy loam to loam till derived from dolomite, marble, and chert.

Topography. The soils occupy undulating to strongly rolling terrain.

Drainage. The Lead soils are well drained.

Vegetation. Some small areas are still covered with balsam fir, white spruce, and black spruce. Most areas of these soils have been cleared and are seeded to hay.

Soil classification. Sombric Humo-Ferric Podzol.

Description of a representative profile.

Horizon	Depth (cm)	Description
Ap	0-25	Very dark grayish brown (10YR 3/2 m), dark brown (10YR 3/3 d) loam; moderate, medium granular; very friable; clear, wavy boundary; 13-20 cm thick; slightly acid.
Ae	25-33	Pinkish gray (7.5YR 7/2 m, 6/2 d) sandy loam; weak, medium platy; very friable; partly incorporated by earthworms into Ap and Bf; broken, wavy boundary; 0-10 cm thick; extremely acid.
Bf	33-63	Yellowish red (5YR 4/8 m, 5/6 d) sandy loam; weak, medium granular; very friable; gradual, wavy boundary; 10-35 cm thick; extremely acid.
C	63+	Brown (10YR 5/3 m), light yellowish brown (10YR 6/4 d) sandy loam; amorphous; friable; 15-76 cm thick; extremely acid.

Range in characteristics. The Lead soils are moderately stony and slightly to moderately rocky. The texture becomes coarser with depth. Limestone or sandstone is found at 50-120 cm below the surface. Earthworms are common in these soils.

Land use. Most of the Lead soils have been cleared and are now used for hay and pasture. Their limitations for agriculture (Class 5) are high acidity and low fertility (F) and, in some places, stoniness (P) and topography (T). Where the topography is favorable, the soils seem to be well suited for growing vegetables (Classes 3 and 4). Lime and fertilizer are required for successful crop production.

LONG POINT MAP UNIT 392 ha

Location. The soils are found on the east side of Long Point and in the Loretta-Marches Point area.

Parent material. The Long Point soils are developed in a pale brown loam to clay loam till that contains various amounts of sandstone, limestone, shale, and granite fragments.

Topography. The soils occupy undulating to strongly rolling terrain.

Drainage. The Long Point soils are imperfectly drained. A water table is often present within 90 cm of the surface.

Vegetation. The main tree cover is balsam fir and white spruce. The ground cover is juniper, ferns, raspberries, and grasses.

Soil classification. Gleyed Humo-Ferric Podzol.

Description of a representative profile.

Horizon	Depth (cm)	Description
F	6-3	Fibrous, semidecomposed organic matter; clear, wavy boundary; 5-10 cm thick; extremely acid.
H	3-0	Black (2.5YR 2/1 m), very dark grayish brown (10YR 3/2 d) well-decomposed organic matter; greasy; abrupt, wavy boundary; 3-7 cm thick; extremely acid.
Aegj	0-9	Light gray (10YR 7/2 m); pale brown (10YR 6/3 d) silt loam; many coarse, distinct, reddish brown (5YR 4/4 m) mottles; moderate, coarse platy; friable; clear, wavy boundary; 3-15 cm thick; extremely acid.
Bf	9-32	Dark reddish brown (5YR 3/4 m), strong, brown (7.5YR 5/6 d) silt loam; moderate, fine granular; very friable; gradual, wavy boundary; 17-30 cm thick; very strongly acid.
C	32-86	Pale brown (10YR 6/3 m), light yellowish brown (10YR 6/4 d) clay loam; massive, breaking to weak, fine granular; friable; gradual, irregular boundary; 5-76 cm thick; strongly acid.
IIC	86+	Fine gravel.

Range in characteristics. The soils contain numerous pebbles and cobbles of sandstone and granite, which become more numerous with depth. The surface is moderately stony and slightly rocky on Long Point, and exceedingly stony and moderately rocky in the Loretta-Marches Point district. The Long Point soils are associated with the Lourdes soils. The till grades into sandstone or gravel at a depth of 25-122 cm from the surface.

Land use. The Long Point soils support a moderately good forest and are best suited to this use. A large percentage of the soils have been cleared and are used for hay and pasture. Agricultural use is limited by imperfect drainage (W), low fertility (F), stoniness (P), rockiness (R), and steep slopes (T).

LOURDES MAP UNIT 212 ha

Location. The soils occur along the east side of Long Point in association with the Long Point soils.

Parent material. The Lourdes soils are developed from a brown loam till derived from limestone, sandstone, shale, and some granite.

Topography. The soils occupy moderately rolling terrain.

Drainage. The soils are well drained throughout the profile.

Vegetation. Balsam fir and white spruce are the main trees, with a ground cover of bunchberry.

Soil classification. Orthic Humo-Ferric Podzol.

Description of a representative profile.

Horizon	Depth (cm)	Description
L-F	5-0	Semidecomposed organic matter; fibrous; abundant, very fine to medium horizontal roots; abrupt, smooth boundary; 2-10 cm thick.
Ae	0-8	Pockets of light gray (10YR 7/1 m), light reddish brown (5YR 6/4 m) and reddish brown (5YR 5/4 m), pinkish gray (7.5YR 7/1 d) silt loam; weak, fine platy; very friable; plentiful, very fine and fine vertical and oblique roots; abrupt, wavy boundary; 2-13 cm thick; extremely acid.
Bf1	8-25	Yellowish red (5YR 4/8 m), strong, brown (7.5YR 5/6 d) silt loam; weak, medium granular; very friable; plentiful, very fine random roots; clear, wavy boundary; 10-25 cm thick; extremely acid.
Bf2	25-51	Reddish brown (5YR 4/4 m), reddish yellow (7.5YR 6/6 d) silt loam; weak, medium granular; very friable, few very fine random roots; abrupt, smooth boundary; 15-30 cm thick; strongly acid.
C	51+	Brown (7.5YR 5/4 m), light yellowish brown (10YR 6/4 d) loam; amorphous; friable; very few fine random roots; numerous sandstone slabs; slightly acid.

Range in characteristics. The till contains sand and gravel pockets, small fragments of shale and sandstone, small granitic pebbles, and occasional small pieces of limestone. The surface is moderately stony and slightly rocky.

Land use. Low fertility or high acidity (F) and moderately steep slopes (T) limit the use of the Lourdes soils for agriculture (Class 5). Stones and rocks also provide some hindrance to cultivation. Where conditions are favorable (Class 4), the soils are suitable for vegetable growing if heavily limed and fertilized. Precautions must be taken to prevent water erosion.

MAINLAND MAP UNIT 797 ha

Location. The soils occur in numerous large and small areas east of Mainland.

Parent material. The Mainland soils have developed on a brown to dark grayish brown silty clay loam till, derived mainly from shale, limestone, graywacke, conglomerate, and sandstone.

Topography. The topography is generally moderately sloping, but the soils are also found on gently to moderately rolling terrain.

Drainage. The Mainland soils are very poorly drained.

Vegetation. Balsam fir, black spruce, white birch, alder, and pin cherry are the main tree cover. In a few areas, stunted black spruce and occasional stunted larch are the main trees. The ground cover consists of sphagnum moss, reindeer-moss, sheep-laurel, Labrador-tea, horsetail, blueberry, and yew.

Soil classification. Fera Luvic Gleysol.

Description of a representative profile

Horizon	Depth (cm)	Description
L-F	15-0	Black (5YR 2/1 m), semidecomposed organic matter; fibrous; abundant, very fine to medium random roots; abrupt, wavy boundary; 10-30 cm thick.
Ae	0-8	Pinkish gray (7.5YR 6/2 m, 7/2 d) silty clay; moderate, medium platy; firm; few very fine and fine oblique roots; clear, wavy boundary; 5-10 cm thick; extremely acid.
Aegj	8-18	Brown (7.5YR 5/2 m), pinkish gray (7.5YR 7/2 d) silty clay loam; few fine and medium brown (7.5YR 5/4 m) mottles; moderate, coarse blocky, breaking to moderate, coarse platy; firm; few very fine to medium oblique roots; clear, wavy boundary; 7-15 cm thick; extremely acid.
Btgf	18-30	Greenish gray (5G 5/1 m), yellow (10YR 7/6 d) clay; many medium and coarse, prominent, yellowish brown (10YR 5/4 m) and yellowish red (5YR 5/8 m) mottles; massive, breaking to strong, very coarse, subangular blocky; very firm; few very fine to medium random roots; clear, wavy boundary; 7-18 cm thick; extremely acid.
Cgl	30-61	Brown (10YR 5/3 m), pale brown (10YR 6/3 d) silty clay loam; massive; firm; very few very fine oblique roots; clear, wavy boundary; 25-35 cm thick; very strongly acid.

Cg2	61+	Dark grayish brown (10YR 4/2 m), light yellowish brown (10YR 6/4 d) silty clay loam; massive; firm; very few very fine oblique roots; strongly acid.

Range in characteristics. The Mainland soils have fine-textured profiles that often contain numerous sandstone slabs and small shale fragments. Surface stoniness ranges from stone-free to moderate.

Land use. The Mainland soils are of little use for agriculture (Class 7). They support a poor stand of stunted forest and where they are not wooded, the surface is covered with a layer of peat from 5-35 cm thick. Blueberries grow profusely on these peaty areas. Extremely poor drainage (W), low permeability, unfavorable soil structure (D), plasticity, and stickiness limit the use of these soils for crops or pasture.

MARCHES POINT MAP UNIT 8255 ha

Location. The thin, organic soils are widespread in the central area of the Peninsula.

Parent material. The soils consist mainly of partly decomposed sphagnum and other mosses, with minor amounts of leaves and roots.

Topography. The sloping bogs occupy various types of topography, from gently rolling slopes to very steep and hilly country.

Drainage. Impeded to poor.

Vegetation. The main vegetation consists of sphagnum and other mosses; lichens, such as reindeer-moss, under scattered shrubs of sheep-laurel, mountain cranberry, and ground juniper; and stunted scattered trees, such as balsam fir and black spruce, and occasionally pin cherry.

Soil classification. More than 80% Typic Mesisol.

Description. The soils consist of 10-30 cm of partly decomposed (mesic) organic material of mainly sphagnum moss over limestone bedrock. Up to 15 cm of mineral soils with Podzolic development (with thin Ae and BP horizons) may be encountered over the bedrock.

Use potential. The soils could be considered for growth of trees.

PICCADILLY MAP UNIT 1275 ha

Location. The Piccadilly soils are found in lowlands on the southern end of Shoal Point, in the vicinity of West Bay and Lourdes, around Piccadilly Bay, and in association with the Lead soils.

Parent material. The soils are developed in a calcareous gray, shaly, clay loam till derived from shale, limestone, graywacke, conglomerate, and sandstone.

Topography. The soils occupy gently sloping to depressional areas.

Drainage. The profile is poorly drained and is saturated with water for most of the year.

Vegetation. Black spruce, alder, and some balsam fir are the main tree cover, with a ground cover of sedge, raspberry, and blueberry.

Soil classification. Orthic Gleysol.

Description of a representative profile.

Horizon	Depth (cm)	Description
Of	25-13	Fibrous, undecomposed organic matter; gradual, smooth boundary; 7-20 cm thick; extremely acid.
Oh	13-0	Very dark brown (10YR 2/2 m), very dark grayish brown (10YR 3/2 d) well-decomposed organic matter; mucky; clear, smooth boundary; 7-20 cm thick; extremely acid.
Bg	0-15	Gray (5Y 5/1 m), light olive gray (5Y 6/2 d) loam; massive; sticky, plastic; numerous small shale fragments and pockets of coarse sand; gradual, wavy boundary; 12-20 cm thick; very strongly acid.
Ckg	15-60	Gray (5Y 5/1 m), light gray (5Y 7/1 d) clay loam; massive; sticky, plastic; numerous small shale fragments; neutral.

Range in characteristics. The Piccadilly soils are moderately stony, but surface stones are not evident because of the surface peaty layer. The soils usually contain numerous pockets of coarse sand and gravel.

Land use. The Class 5 soils cover about 3.4% of the Peninsula. Most areas that are made up of these soils are covered with stunted trees, but a few areas have been cleared along the coast and are used for pasture and hay. Liming and fertilizing improve the soils, but the plasticity of the soil material (D) makes it difficult to cultivate. Poor drainage (W) and lack of aeration also limit crop production. Small garden plots are mantained to grow root crops for home consumption, where the organic surface is thick enough to permit its cultivation without disturbing the fine-textured subsoil.

PIGEON HEAD MAP UNIT 286 ha

Location. The organic soils can be found in several small areas in the western part of the Peninsula.

Parent material. The horizontal bogs are composed mainly of slightly decomposed sphagnum mosses. Woody material in layers of more decomposed organic material is common at greater depth.

Topography. Depressions or sites where moisture is plentiful most of the year.

Drainage. Poorly to very poorly drained.

Vegetation. Scattered stunted black spruce and larch, with a shrub vegetation of sheep-laurel, some Labrador-tea, and baked-apple over mainly sphagnum moss.

Soil classification. More than 80% Mesic Fibrisols.

Description. The top 120-150 cm consists of relatively undecomposed (fibric) sphagnum moss. This is underlain by 25-150 cm of partly (mesic) decomposed moss. A thin layer of well-decomposed organic (humic) material may be present overlying the mineral soil.

Use potential. These soils could be considered for production of horticultural peat moss.

PORT AU PORT MAP UNIT 4136 ha

Location. Large areas of these soils are found throughout the southern part of the Peninsula.

Parent material. The Port au Port soils are developed in a brown loam or clay loam till derived from dolomite, marble, shale, and chert over limestone.

Topography. The topography is commonly strongly rolling, but may range from gently sloping to hilly.

Drainage. The Port au Port soils are well drained.

Vegetation. The tree cover is balsam fir, black spruce, white birch, mountain maple, mountain ash, and pin cherry, with an understory of ferns and blueberry.

Soil classification. Orthic Humo-Ferric Podzol.

Description of a representative profile.

Horizon	Depth (cm)	Description
F	5-0	Dark reddish brown (5YR 2/2 m, 3/3 d), semidecomposed organic matter; fibrous; plentiful, fine to coarse horizontal roots; abrupt, wavy boundary; 2-10 cm thick; extremely acid.
Ae	0-4	Light brown (7.5YR 6/4 m), pinkish gray (7.5YR 7/2 d) sandy loam; moderate, medium platy; friable; clear, wavy boundary; 1-6 cm thick; extremely acid.
Bf	4-19	Yellowish red (5YR 5/8 m, 5/6 d) loam; moderate, fine granular; very friable; gradual, wavy boundary; 10-20 cm thick; extremely acid.
C	19-50	Brown (7.5YR 5/4 m), light brown (7.5YR 6/4 d) loam; massive, breaking to moderate, coarse, subangular blocky; friable; abrupt, irregular boundary; 20-60 cm thick; very strongly acid.
R	50+	Limestone.

Range in characteristics. Limestone outcrops are very numerous in Port au Port soil areas, and the soils are moderately stony. Limestone is usually found within 50 cm of the surface, but may vary in depth between 25 and 100 cm. The soils are uniformly medium-textured.

Land use. The Port au Port soils occupy about 10.9% of the Peninsula. They support a good forest stand where bedrock is not too near the surface; otherwise the forest cover is sparse and stunted. Only a few small areas of the Port au Port soils near the coast have been cleared and are used for hay and pasture. A small area with favorable soil depth and suitable topography near Boswarlos could be used for vegetable growing if proper cultural practices were applied.

Rockiness (R), stoniness (P), and steep slopes (T) are the main limitations to the use of these Class 7 soils. There are a few areas (Class 5) with suitable topography, where bedrock is not too near the surface, that could be cleared and used for hay or pasture.

QUARRIES MAP UNIT 65 ha

The Quarries map unit indicates where limestone or gravel has been mined. The areas have no agricultural use. Two limestone quarries at Aguathuna and a gravel pit at Ship Cove were delineated on the map.

RED ISLAND MAP UNIT 40 ha

Location. Two small areas west of the town of West Bay Centre, west of West Bay.

Parent material. Only slightly decomposed mosses, cotton-grass, roots, some woody plants, and partly decomposed wood fragments.

Topography. The sloping bogs formed originally along depressions and now cover the area with gentle slopes to a drainage channel in the center.

Drainage. Poor to very poor.

Vegetation. Mainly sphagnum moss with some cotton-grass and some herbaceous plants such as bog-rosemary and baked-apple. Scattered larch and stunted black spruce may also be present.

Soil classification. More than 80% Humic Mesisols.

Description. The soils have a thin surface layer of slightly decomposed moss, cotton-grass, and cotton-grass roots over partly decomposed (mesic) moss, cotton-grass, and some woody material to a depth of 100-120 cm. It is underlain by well-decomposed organic material with remains of wood stumps and tree roots. The mineral soil can generally be found at a depth of 180 cm or deeper.

Use potential. The soils may warrant consideration for fuel peat mining or vegetable and tree production.

ROCK LAND MAP UNIT 3650 ha

The areas mapped as Rock Land consist of exposed bedrock, usually limestone, on the Port au Port Peninsula. Small areas of thin organic soils are associated with the Rock Land. Most of the Rock Land is found in the mountainous region between Sheaves Cove and Cape St. George. Smaller areas are found on steep-sided stream banks.

The topography of the Rock Land ranges from moderately to extremely sloping. These areas have no agricultural value.

ROUND HEAD MAP UNIT 344 ha

Location. The soils occur in two small areas near Round Head, southwest of Lourdes.

Parent material. The Round Head soils have developed in a light olive brown to brown silty clay loam to clay loam till that contains numerous fragments of shale, limestone, sandstone, or granite.

Topography. The soils occupy moderately sloping to strongly rolling terrain.

Drainage. The soil profile is moderately well drained.

Vegetation. The natural vegetation is balsam fir, black spruce, white birch, mountain maple, and mountain ash. The ground cover consists of ferns, bunchberry, raspberry, and yew.

Soil classification. Orthic Gray Luvisol.

Description of a representative profile

Horizon	Depth (cm)	Description
L-F	8-0	Dark reddish brown (5YR 2/2 d), semidecomposed organic matter; fibrous; abundant, very fine to coarse horizontal roots; abrupt, wavy boundary; 5-10 cm thick.
Ae	0-3	Light reddish brown (5YR 6/4 m), pink (5YR 7/3 d) silt loam; moderate, medium platy; slightly hard; few very fine to medium vertical roots; tongueing; abrupt, irregular boundary; 1-8 cm thick; extremely acid.
Bt1	3-22	Brown (7.5YR 5/4 m), reddish yellow (7.5YR 6/6 d) silty clay loam; moderate, medium granular; friable; few very fine to medium oblique roots; clear, wavy boundary; 15-30 cm thick; extremely acid.
Bt2	22=43	Brown (10YR 5/3 m), very pale brown (10YR 7/4 d) silty clay loam; massive, breaking to moderate, coarse, subangular blocky; firm; few fine oblique roots; clear, wavy boundary; 15-30 cm thick; extremely acid.
C	43+	Mixture of light olive brown (2.5Y 5/4 m) and reddish brown (5YR 5/3 m), pale yellow (2.5Y 7/4 d) silty clay loam; moderate, medium, and coarse platy; very firm; very few fine oblique roots; sandstone and shale; extremely acid.

Range in characteristics. The Round Head soils are uniformly fine-textured and moderately to very stony. The profiles contain numerous shale and some sandstone fragments. These fragments become more numerous with depth, and the till grades into bedrock, usually between 50 and 90 cm from the surface.

Land use. The main limitations to the use of the Round Head soils (Class 5) are steep slopes (T), high acidity, low fertility (F), and a slightly unfavorable subsoil structure. Lime and fertilizer are required for any crop production on these soils. Some areas on gentler slopes (Class 4) are suitable for vegetable growing, and some of the steeper slopes could be used for pasture.

SALMON COVE MAP UNIT 105 ha

Location. The Salmon Cove soils occur in a few scattered areas in the southern part of the Peninsula.

Parent material. The soils have developed on brown alluvial sands and gravel.

Topography. The landscape of the soils is nearly level to undulating.

Drainage. The soils are poorly drained.

Vegetation. Balsam fir, mountain maple, mountain ash, white birch, and alder form the main tree cover. The ground cover is mainly horsetail and ferns.

Soil classification. Orthic Gleysol.

Description of a representative profile.

Horizon	Depth (cm)	Description
F	15-10	Black (5YR 2/1 m), semidecomposed organic matter; fibrous; plentiful, very fine to coarse horizontal and oblique roots; clear, wavy boundary; 5-10 cm thick.
H	10-0	Black (5YR 2/1 m), well-decomposed organic matter; greasy; plentiful, very fine and fine vertical and oblique roots; abrupt, smooth boundary; 7-15 cm thick.
Bgj	0-10	Dark reddish brown (5YR 3/2 m), brown (7.5YR 5/2 d) silty clay loam; moderate, medium, and coarse blocky; friable; few very fine to medium random roots; clear, wavy boundary; 5-15 cm thick; strongly acid.
Bg	10-30	Grayish brown (10YR 5/2 m), very pale brown (10YR 7/3 d) loam; common, medium, prominent, strong brown (7.5YR 5/6 m) mottles; massive, breaking to strong, very coarse, subangular blocky; firm; few very fine and fine oblique roots; gradual, wavy boundary; 15-25 cm thick; medium acid.
C	30+	Brown (10YR 5/3 d) sandy loam; loose, single grain; nonsticky, nonplastic; water table at 61.0 cm; strongly acid.

Range in characteristics. These soils become coarser with depth. Poor drainage reflects their relatively low position in the landscape. The soils are slightly to very stony, but the stones are covered by the surface organic layer.

Land use. The Salmon Cove soils (Class 5) are not suitable for vegetable crops, but may be used for pasture when cleared and properly managed.

SHEAVES COVE MAP UNIT 168 ha

Location. These organic soils occur mainly east of Piccadilly Bay.

Parent material. Relatively undecomposed sphagnum and some other mosses and roots.

Topography. The sloping bogs occur in depressional sites where moisture is plentiful most of the year in gently to very gently sloping surroundings.

Drainage. Poor to very poor.

Vegetation. The soils support a vegetation of scattered stunted black spruce and larch with an understory of sheep-laurel and Labrador-tea over a surface vegetation mainly of cotton-grass and sphagnum moss.

Soil classification. More than 80% Mesic Fibrisol.

Description. The surface of this soil consists of relatively undecomposed sedges, sphagnum moss, and grass to a depth of 90-120 cm. Thin layers of more decomposed (humic) material occur between partly decomposed (mesic) organic material at depths of 20-200 cm, which in turn overlies well-decomposed (humic) organic material a few centimetres thick, on top of mineral soil.

Use potential. These soils could be considered for production of vegetables, forage, or trees.

SHIP COVE MAP UNIT 382 ha

Location. The organic soils are scattered over the central part of the Peninsula.

Parent material. The soils are derived from sphagnum mosses. The lower part may contain residues of sedges and sedge roots. A thin layer of black, well-decomposed muck may be found at the bottom, as well as partly decayed wood from roots or tree stumps.

Topography. The horizontal bogs are generally located in depressions and have gently sloping topography.

Drainage. The organic soils are very poorly drained; mud ponds are very common.

Vegetation. Ground cover consists of sphagnum moss with shrubs such as sheep-laurel, scattered blueberry, Labrador-tea, and some cotton-grass and baked-apple.

Soil classification. More than 80% Terric Fibrisol.

Description. Fibric or relatively undecomposed sphagnum moss extends from the surface to a depth of 1-1.5 m. A thin layer of partly decomposed (mesic) peat over a thin layer of well-decomposed (humic) peat overlying the mineral soil or over rock is not uncommon.

Use potential. The soils could be considered for tree production.

SHOAL POINT MAP UNIT 1400 ha

Location. The soils occur in the lowland coastal areas on Shoal Point, between West Bay Centre and West Bay, and between Three Rock Cove and Mainland.

Parent material. The Shoal Point soils are developed in an olive to olive gray silty clay to clay till derived from mainly red, green, and black shale, with minor amounts of limestone, graywacke, and conglomerate.

Topography. The soils occupy gently undulating to undulating terrain, and in some places, gently rolling terrain.

Drainage. Shoal Point soils are very poorly drained.

Vegetation. The main tree cover is black spruce and alder, with scattered balsam fir and white birch. The ground cover consists of sphagnum moss, Labrador-tea, sheep-laurel, horsetail, sedge, and blueberry.

Soil classification. Orthic Gleysol.

Description of a representative profile.

Horizon	Depth (cm)	Description
Of	38-30	Undecomposed moss; abundant, fine, medium, and coarse horizontal roots; clear, smooth boundary; 5-10 cm thick.
Om	30-25	Semidecomposed organic matter; fibrous; abundant, fine, medium, and coarse horizontal roots; clear, smooth boundary; 2-8 cm thick.
Ohl	25-20	Black (10YR 2/1 m), well-decomposed organic matter; greasy; abundant, fine, medium, and coarse horizontal roots; clear, smooth boundary; 2-8 cm thick.

Oh2	20-0	Dark brown (7.5YR 3/2 m), well-decomposed organic matter; greasy; abundant, very fine and fine vertical and oblique roots; abrupt, smooth boundary; 10-20 cm thick.
Aeg	0-10	Reddish gray (5YR 5/2 m), light gray (10YR 7/2 d) heavy clay; massive; sticky, plastic; plentiful, very fine to medium vertical and oblique roots; abrupt, smooth boundary; 7-15 cm thick; extremely acid.
Bg	10-23	Greenish gray (5G 5/1 m), very pale brown (10YR 7/3 d) clay; common, medium, prominent, strong brown (7.5YR 5/8 m) mottles; massive; very sticky, very plastic; plentiful, very fine and fine vertical roots; clear, smooth boundary; 10-20 cm thick; strongly acid.
C	23-51	Pockets of olive gray (5Y 5/2 m), olive (5Y 5/3 m), and pale olive (5Y 6/3 d) silty clay; massive; slightly sticky, plastic; very numerous small shale fragments; gradual, wavy boundary; 25-60 cm thick; slightly acid.
R	51+	Soft, crumbly shale. Water table present.

Range in characteristics. The Shoal Point soils are uniformly fine textured and usually contain numerous small shale fragments. The parent material grades into shale between 25 and 90 cm from the surface. The soils are slightly to moderately stony.

Land use. The Shoal Point soils are unsuitable for agriculture and are limited by wetness, lack of aeration, low permeability, and extreme stickiness and plasticity. They support a very poor stand of stunted forest.

TEA COVE MAP UNIT 251 ha

Location. The soils are found in scattered locations on the Peninsula in association with the West Bay soils.

Parent material. The Tea Cove soils are developed in dark grayish brown, sandy alluvial sediments.

Topography. The soils occupy undulating to gently rolling topography.

Drainage. The Tea Cove soils are somewhat imperfectly drained because of their relatively low position in the landscape.

Vegetation. Alder, balsam fir, white spruce, and white birch are the main trees. The ground cover consists of dewberry, plume moss, and horsetail. Where the surface is peaty, scattered, stunted black spruce and alder together with sheep-laurel, Labradaor-tea, sphagnum moss, and horsetail are the main cover.

Soil classification. Gleyed Humo-Ferric Podzol.

Description of a representative profile.

Horizon	Depth (cm)	Description
L-F	5-0	Semidecomposed organic matter; fibrous; abundant, very fine to medium random roots; abrupt, smooth boundary; 2-8 cm thick.
Aegj	0-10	Light reddish brown (5YR 6/4 m, 6/3 d) loam; few fine, prominent, yellowish red (5YR 4/8 m) mottles; moderate, medium granular; very friable; plentiful, very fine to medium oblique roots; abrupt, smooth boundary; 2-13 cm thick; extremely acid.
Bf1	10-25	Dark reddish gray (5YR 4/2 m), reddish brown (5YR 5/3 d) sandy loam; weak, medium granular; very friable; plentiful, very fine and fine oblique roots; clear, smooth boundary; 13-20 cm thick; extremely acid.
Bf2	25-38	Dark brown (7.5YR 4/2 m), brown (7.5YR 5/4 d) sandy loam; massive; loose; few very fine vertical roots; abrupt, smooth boundary; 8-15 cm thick; extremely acid.
BC	38-41	Black (5YR 2/1 m), very dusky red (2.5YR 2/2 d) sandy loam; massive; very firm; abrupt, smooth boundary; 0.5-3 cm thick; very strongly acid.
C	41-66	Dark grayish brown (10YR 4/2 m), pale brown (10YR 6/3 d) sandy loam; single grain; loose; abrupt, smooth boundary; 20-40 cm thick; medium acid.
Cca	66+	Limestone gravel.

Range in characteristics. The profiles are coarse-textured and slightly to moderately stony.

Land use. The Tea Cove soils are unsuitable for cultivated crops. They could be used for pasture (Class 5) when cleared, limed, and fertilized.

THREE ROCK COVE MAP UNIT 58 ha

Location. The soils occur in a narrow band about 2.4 km along the coast at Three Rock Cove.

Parent material. The Three Rock Cove soils consist of a thin layer of peat or leaf litter over gravel.

Topography. The soils occupy gently sloping topography.

Drainage. The Three Rock Cove soils are well drained because of the rapid permeability of the underlying gravel.

Vegetation. Balsam fir is the main tree cover, with an understory of ferns. Raspberries and timothy grow in cut-over areas.

Soil classification. Orthic Regosol.

Description of a representative profile.

Horizon	Depth (cm)	Description
F	15-10	Semidecomposed organic matter; fibrous; clear, smooth boundary; 2-8 cm thick.
H	10-0	Well-decomposed organic matter; greasy; abrupt, smooth boundary; 7-15 cm thick;
C	0-60	Gravel

Land use. Small patches of the Three Rock Cove soils have been cleared, limed, and fertilized and are used for pasture (Class 5). They are extremely droughty. The soil material can be used for road and concrete gravel.

VICTORS BROOK MAP UNIT

Location. The Victors Brook soils occur mainly west and south of West Bay, in the same vicinity as the Hardwood soils. They have not been mapped separately but only with other soils.

Parent material. The soils are developed in a dark greenish gray to dark brown loam to clay loam till derived mainly from shales, with some limestone, graywacke, and conglomerate.

Topography. The soils occupy gently to strongly rolling topography.

Drainage. The drainage of the soils is imperfect because the underlying bedrock keeps the soils moist.

Vegetation. The natural vegetation is balsam fir, white birch, mountain ash, mountain maple, alder, and pin cherry, with an understory of ferns.

Soil classification. Gleyed Gray Luvisol.

Description of a representative profile.

Horizon	Depth (cm)	Description
L-F	8-0	Semidecomposed organic matter; fibrous; abrupt, smooth boundary; 5-10 cm thick.

Ae	0-8	Light brown (7.5YR 6/4 m) loam; moderate, medium platy; friable; abrupt, wavy boundary; 5-10 cm thick.
Btg	8-33	Brown (7.5YR 5/4 m) clay loam; common, medium, prominent, yellowish red (5YR 5/8 m) mottles; massive; friable; sandstone fragments and sand pockets; gradual, wavy boundary; 15-25 cm thick.
C	33-90	Dark brown (7.5YR 4/4 m) clay loam; massive; friable; sandstone fragments and sand pockets; gradual, wavy boundary; 15-70 cm thick.
R	90+	Sandstone

Range in characteristics. The Victors Brook soils contain numerous sandstone fragments and pockets of sand. They are moderately stony and slightly rocky. The till overlies sandstone bedrock usually between 25 and 50 cm from the surface, but occasionally deeper. The bedrock tends to restrict drainage to some extent.

Land use. The Victors Brook soils occupy less than 1% of the Peninsula. They are unsuitable for crops because of shallowness, steep slopes, and low natural fertility. They are suitable for pasture (Class 5) when cleared, limed, and fertilized. The soils support a fairly good stand of forest.

WEST BAY MAP UNIT 1121 ha

Location. The West Bay soils are found in small, isolated patches at the mouths of streams.

Parent material. The soils are developed in a gray brown alluvial sediment, which varies from fine sand to fine gravel.

Topography. The West Bay soils occupy very gently sloping to gently rolling terrain.

Drainage. The soils are well drained to rapidly drained.

Vegetation. Balsam fir, white spruce, black spruce, and alder are the main trees.

Soil classification. Orthic Humo-Ferric Podzol.

Description of a representative profile.

Horizon	Depth (cm)	Description
F	4-1	Semidecomposed organic matter; fibrous; abrupt, smooth boundary; 1-8 cm thick; extremely acid.

H	1-0	Black (10YR 2/1 m, d), well-decomposed organic matter; greasy; abrupt, wavy boundary; 1-5 cm thick; extremely acid.
Ae	0-5	Pinkish gray (7.5YR 7/2 m), pinkish white (7.5YR 8/2 d) sandy loam; single grain; loose; fine gravelly; clear, wavy boundary; 2-10 cm thick; extremely acid.
Bf1	5-9	Reddish brown (5YR 4/4 m), yellowish red (5YR 4/8 d) sandy clay loam; weak, medium granular; very friable; fine gravelly; clear, wavy boundary; 2-8 cm thick; extremely acid.
Bf2	9-19	Yellowish red (5YR 4/8 m, 5/6 d) sandy clay loam; weak, medium granular; very friable; gradual, wavy boundary; 8-15 cm thick; extremely acid.
BC	19-36	Reddish yellow (7.5YR 7/6 m), strong brown (7.5YR 5/6 d) loamy sand; weak, medium granular; very friable; gradual, smooth boundary; 12-25 cm thick; extremely acid.
C	36+	Grayish brown (2.5Y 5/2 m), light yellowish brown (2.5Y 6/4 d) sandy clay loam; amorphous; friable; extremely acid.

Range in characteristics. The textures of the West Bay soils vary with depth, because the parent materials are usually stratified. In general, they are moderately coarse to coarse-textured.

Land use. Most of the West Bay soils have been cleared and are used for hay and pasture. The soils are suitable for vegetable growing (Class 4), provided that water is available for the crops in periods of drought. Lime and fertilizer are necessary for successful crop production.

WINTERHOUSE MAP UNIT 192 ha

Location. The Winterhouse soils occur in a narrow band along the west side of the southern section of Long Point.

Parent material. The soils are developed in a reddish brown sandy loam till derived mainly from soft sandstone and from siltstone, shale, conglomerate, and limestone.

Topography. The soils occupy undulating to gently rolling topography.

Drainage. The Winterhouse soils are well drained throughout the profile.

Vegetation. The tree cover is balsam fir, black spruce, and alder. The coniferous trees have been stunted by wind and lean in a direction parallel with the predominant wind direction.

Soil classification. Eluviated Dystric Brunisol.

Description of a representative profile.

Horizon	Depth (cm)	Description
F	6-0	Very dark brown (10YR 2/2 m), dark brown (10YR 3/3 d) semidecomposed organic matter; fibrous; abundant, very fine to medium horizontal roots; clear, smooth boundary; 2-10 cm thick; extremely acid.
Ae	0-6	Brown (7.5YR 5/2 m), pinkish gray (7.5YR 6/2 d) sandy loam; weak, medium platy; very friable; clear, wavy boundary; 2-10 cm thick; extremely acid.
Bfj	6-18	Dark reddish brown (5YR 3/3 m, 3/4 d) sandy loam; weak, medium blocky; friable; gradual, wavy boundary; 10-35 cm thick; extremely acid.
C	18+	Dark reddish brown (5YR 3/2 m), reddish brown (5YR 4/3 d) sandy loam; single grain; friable; crumbly sandstone fragments in laminar alignment; strongly acid.

Range in characteristics. The parent material of these soils has a range from fine sand or fine gravel to soft sandstone. The soils are slightly stony. Where the soils have been cleared, they have friable, sandy loam Ap horizons, 12-20 cm thick. Trees on the forested areas have been stunted by the wind.

Land use. Most of the Winterhouse soils have been used for hay and pasture. The main hazards to use are low fertility, acidity, and droughtiness. The first two factors can be overcome by liming and fertilization. In most years, the rainfall is sufficient to prevent droughtiness. The Winterhouse soils should be suitable for vegetable growing (Class 4). It may be necessary to erect windbreaks to protect vegetables from strong winds.

LAND USE

Most of the land clearing and agricultural development on the Port au Port Peninsula have taken place in the 20th century. The cropping practices and the crops grown have changed little since the early days of settlement. Agricultural development has been limited to a small-scale subsistence type. Most of the arable land is used for hay and pasture to support livestock. Small areas are used for growing potatoes, cabbage, and turnips for home consumption.

In 1965, the 329 farms on the Peninsula occupied about 2.5% of the land area (Table 5). The size of the average farm was 2.3 ha. The smallest farm occupied about 0.4 ha and the largest, about 10 ha. The largest farming areas were West Bay and Piccadilly. Other important areas were Cape St. George, Ship Cove, De Grau, Campbells Creek, Mainland, and Boswarlos.

Sheep, cattle, and poultry were the most important livestock raised on the Peninsula and they are still used, mainly for home consumption. Small numbers of horses are kept for farm use and small-scale lumbering operations.

In some parts of the Peninsula, lumbering supplements the income from fishing and farming. Pulpwood is cut during the winter, and a few small sawmills are operated. There are about 115 km^2 of productive forest suitable for pulpwood, consisting mainly of balsam fir and black spruce. Most farms on the Peninsula are of a subsistence type, where fishing, farming, and lumbering are combined. In general, farm incomes are low.

LAND USE CAPABILITY

The use of land for agriculture depends on a number of physical conditions such as stoniness, rockiness, wetness, droughtiness, slope, susceptibility to erosion, and fertility. The soils of the Peninsula were classified for agricultural use by the methods used for the Canada Land Inventory (1965).

The soil capability classification for agriculture is an interpretive grouping of soils developed on the characteristics of the soil mapping units. In this classification, the mineral soils are grouped into seven classes according to their suitability and limitations for agricultural use. The limitations become increasingly severe from Class 1 to Class 7. Class 1 soils have no limitations for agriculture.

Classes 1-3 are capable of sustained production of common cultivated crops, and the fourth class is marginal for sustained arable culture. The soils in Classes 1-4 are also capable of use for perennial forage crops. Class 5 is suitable only for

Table 5. Number of livestock and hectarage, and use of farm land on the Port au Port Peninsula, 1965

Region* or settlement	Horses	Cattle	Cows and heifers	Sheep	Pigs	Poultry	Potatoes (sacks)	Turnips (sacks)	Cabbage (heads)	Hay (tonnes)	Farmland (hectares)	Farms	Averge hectares per farm
Region 1	29	96	57	696	4	162	891	23	0	216	125	50	3
Region 2	18	85	46	516	14	125	990	0	0	194	87	27	3
Lourdes	23	102	21	348	28	147	1228	0	0	257	107	49	2
Region 3	35	227	123	325	18	323	1539	0	0	268	126	45	3
Region 4	23	89	52	365	3	396	1487	0	200	189	130	49	3
Ship Cove	5	12	7	134	4	73	474	0	0	80	59	21	3
Piccadilly	11	89	46	332	17	110	1359	0	0	179	77	33	2
West Bay	13	48	28	249	5	87	192	0	0	182	84	21	4
Region 5	13	82	51	259	10	162	706	0	0	181	99	23	4
Boswarlos	10	38	21	70	4	38	267	0	0	100	55	11	5
Totals	180	868	452	3294	107	1623	8659	23	200	1846	949	329	3

Source: Report compiled by two students from Scotland from a survey of agriculture on the Port au Port Peninsula during the summer of 1965.

*Region 1: Mainland, Three Rock Cove, Salmon Cove.
Region 2: Long Point, Black Duck Brook, Winterhouse.
Region 3: Cape St. George, De Grau.
Region 4: Red Brook, Marches Point, Loretto, Big Cove, Sheaves Cove, Lower Cove, Abrahams Cove.
Region 5: Campbells Creek, Felix Cove.

permanent pasture or hay, Class 6 can be used only for natural pasture, and Class 7 is not suitable for agricultural use. The soils in all classes may be suitable for forestry, wildlife, or recreation.

The classification consists of two main categories: the capability class, which is a group of subclasses that have the same relative degree of limitation; and the subclass, which includes soils that have the same kind of limitation.

The soils of the area have one or more of the following kinds of limitations to agricultural use:

d - undesirable soil structure or permeability, or both
f - low fertility
i - inundation or flooding
m - moisture limitation
p - stoniness
r - restriction of the rooting zone by bedrock
s - adverse effect of two or more limitations such as d, m, f, or n (salinity)
t - topography
w - excess water

On the soil capability map, the class and subclass are designated by a class numeral followed by one or more subclass letters, for example 4 p, t denotes a soil with Class 4 (severe) limitations of stoniness and topography. This classification applies only to mineral soils.

In the tables accompanying the discussion that follows, the soils are listed with their topographic and "stoniness + rockiness" symbols as they appear on the soil map. The symbols for topography are as follows:

Simple topography Single slopes Regular surface		Complex topography Multiple slopes Irregular surface	Slope (%)
A	depressional to level	a nearly level	0 to 0.5
B	very gently sloping	b gently undulating	0.5+ to 2
C	gently sloping	c undulating	2.0+ to 5
D	moderately sloping	d gently rolling	5.0+ to 9
E	strongly sloping	e moderately rolling	9.0+ to 15
F	steeply sloping	f strongly rolling	15.0+ to 30
G	very steeply sloping	g hilly	30.0+ to 60

Stoniness is defined as the relative proportion of stones on or in the soil. The classes of stoniness are as follows:

Stones 1 - Slightly stony land. There are some stones, but they offer only slight to no hindrance to cultivation.

Stones 2 - Moderately stony land. There are enough stones to cause some interference with cultivation.

Stones 3 - Very stony land. There are enough stones to constitute a serious handicap to cultivation; some clearing is required.

Stones 4 - Exceedingly stony land. There are enough stones to prevent cultivation unless considerable clearing is done.

Stones 5 - Excessively stony land. This land is too stony to permit any cultivation (boulder or stone pavement).

Rockiness is defined as the relative proportion of rock outcrops in the soil surface. The classes of rockiness are defined as follows:

Rocky 1 - Slightly rocky land. Sufficient bedrock exposures to interfere with tillage, but not to make intertilled crops impracticable.

Rocky 2 - Moderately rocky land. Sufficient bedrock exposures to make tillage of intertilled crops impracticable, but the soil can be worked for hay crops or improved pasture if other soil characteristics are favorable.

Rocky 3 - Very rocky land. Sufficient rock outcrop to make use of machinery impracticable, except for light machinery, where other soil characteristics are especially favorable for improved pasture.

Rocky 4 - Exceedingly rocky land. Sufficient rock outcrop (or very thin soil over bedrock) to make all use of machinery impracticable. The land may have some use for wild pasture or forest, depending on other soil characteristics.

Rocky 5 - Excessively rocky land. Land on which over 90% of the surface is exposed bedrock (rock outcrop).

Some general remarks on the soils in the various capability classes are given in the discussion that follows.

There are no soils in the Port au Port area that qualify as Class 1 or Class 2 soils. Although moisture is adequate, stoniness, topography, low fertility, and soil characteristics are adverse enough to exclude the soils from the first two classes.

Class 3 soils (Table 6) have moderately severe limitations that restrict the range of crops or require special conservation practices. Under good management, these soils are fairly to

Table 6. Soils in land use capability Class 3 (moderately severe limitations)

Land use capability	Limitations	Texture	Soil series, topography, and stoniness + rockiness		Hectares
Undulating to strongly sloping land susceptible to moderate erosion. Soils are well drained; medium moisture-holding capacity; low fertility.	Occasional droughtiness. Moderate to light erosion with tilled crops.	Moderately coarse	Lead	c3R0	13
				D3R0	318
				E3R0	159
Total area, Class 3					491

Table 7. Soils in land use capability Class 4 (severe limitations)

Land use capability	Limitations	Texture	Soil series, topography and stoniness + rockinesss		Hectares
Moderately steep slopes subject to moderately severe erosion. Low fertility, shallowness to bedrock, droughtiness in some soils. Most soils are well drained, some are imperfectly drained, have low permeability, and should not be worked at too high a moisture content. Best suited to hay or pasture, but can be used for vegetables.	Imperfect drainage; low fertility and permeability; adverse subsoil structure, moderate to severe erosion with tilled crops	Moderately fine	Long Point	c2RI	53
				e2RI	232
			Boswarlos	e3RI	59
				e3R0	33
			Round Head	d2R0	79
					458
	Shallow bedrock, low fertility; moderate erosion with tilled crops	Medium	Lourdes	e2RI	212
			Port au Port	c3R0	33
				d3R0	72
			Hardwood	d2RI	305
					623
	Low moisture-holding capacity; low fertility	Moderately coarse	Lead	e3R0	13
			West Bay	b0R0	6
				b1R0	46
				C0R0	39
				C1R0	205
				C2R0	33
				c0R0	72
				c1R0	132
				c2R0	26
				D1R0	13
				D2R0	6
				d1R0	86
				d3R0	6
			Winterhouse	e3R0	6
				c1R0	99
				d1R0	66
					862
Total area, Class 4					1943

moderately high in productivity for a wide range of crops adapted to the region. The factors that restrict cultivation, ease of tillage, planting and harvesting, and maintenance of conservation practices of the soils are mainly climate, topography, stoniness, or a combination of these factors, together with low fertility.

The moderately coarse-textured Lead soils in this class have the widest range in use of all the agricultural soils on the Peninsula. The Lead soils have been used mainly for hay and pasture. However, they should be suitable for row crops if proper land management practices, such as the prevention of soil erosion and adequate liming and fertilization, are used.

The soils in Class 4 (Table 7) have severe limitations that restrict the range of crops or require special conservation practices, or both. They are suitable only for a few crops, or the yields for a range of crops are low, or the risk of crop failure is high. The limitations may affect such farm practices as timing and ease of tillage, planting and harvesting, and application of conservation practices. The soils are low to medium in productivity for a specially adapted crop. The factors that restrict the use of these soils are mainly low fertility, imperfect drainage, adverse subsoil structure and permeability, moderate to severe erosion with tilled crops, and low moisture-holding capacity. Shallowness to bedrock and moderately steep slopes, together with stoniness and rockiness, are other factors that restrict the use of the soils.

All the soils in this class are low in fertility. The Long Point soils are limited by imperfect drainage. A large percentage of these soils have been cleared and used for hay and pasture, but they are best left in forest. Some areas could be used for vegetable growing if they were heavily limed and fertilized, but this use is not recommended. Low permeability and adverse subsoil structure limit the use of the Boswarlos and Round Head soils in this class. They could be used for growing vegetables if care were taken to prevent erosion and if they were not worked at too high a moisture content. Because of their fine texture, they are probably better suited to hay and pasture production.

The Port au Port and Hardwood soils have a restricted rooting zone because of shallowness to bedrock. Some areas where the soil is deeper than average should be suitable for vegetable crops. The Lourdes soils have moderately steep slopes. They should be very well suited to vegetable crops, if precautions are taken to prevent water erosion.

The Lead soils in Class 4 have moderately rolling topography, which makes them subject to water erosion when they are cultivated. The West Bay and Winterhouse soils are limited by

droughtiness during dry seasons. They are well suited to vegetable growing when moisture is adequate. In dry seasons they would require irrigation.

Class 4 soils occupy about 5% of the Peninsula.

Class 5 soils have very severe limitations that restrict their capabilities to perennial forage crops, but improvement practices are feasible. These soils have such serious soil, climatic, or other limitations that they are not capable of use for sustained production of annual field crops. Feasible improvement practices include clearing of bush, cultivation, seeding, fertilizing, and water control.

The main limitations to the use of the soils in Class 5 (Table 8) are the adverse effects of one or more of the following: low water holding capacity, very poor drainage, steep slopes, stoniness, or shallowness to bedrock, which make annual cultivation impractical. Some of the soils in this class can be used for cultivated crops if unusually intensive management practices are used. Other soils are adapted to special crops such as blueberries or orchard crops, which require soil conditions unlike those needed by the common crops. Cultivated field crops may be grown in areas of Class 5 soils where adverse climate is the main limitation, but crop failures usually result under average conditions.

Steep slopes make the Boswarlos and Round Head soils in this class very susceptible to erosion and unsuitable for cultivated crops. They can be used for hay and pasture. This also applies to the Abraham soils, which also have a restricted rooting zone. The Abraham soils should be left in forest or used only for permanent pasture.

The Crow Head soils have similar limitations to the Round Head and Boswarlos soils. In addition, they have extremely low fertility and imperfect drainage. These soils can be used for permanent pasture, but should not be cultivated.

The Belman and Piccadilly soils are unsuitable for cultivation. They are limited by extreme wetness, low permeability, and extremely low fertility. The Piccadilly soils are very plastic when wet and are difficult to cultivate. These two soils could have some use as permanent pasture if they were improved.

The Port au Port, Hardwood, Lead, and Costa soils that occur on steep slopes are severely erodible when cultivated. The Costa and Victors Brook soils have the additional limitations of imperfect drainage and extremely low fertility. All these soils are best left in forest. Some areas could be improved for permanent pasture.

Table 8. Soils in land use capability Class 5 (suitable for grazing and forestry)

Land use capability	Limitations	Texture	Soil series, topography and stoniness + rockiness		Hectares
Steep slopes, shallow bedrock or stoniness that restrict the cultivation of crops, low fertility, poor drainage. Not generally suitable for cultivation.	Steep slopes, shallow bedrock, excessive wetness	Fine	Abraham	D3RI	13
				d3RI	19
				E2R2	66
				F2R3	159
				f3RI	710
		Moderately fine	Boswarlos	f3RI	252
			Round Head	f2R0	99
				f3R0	165
			Crow Head	c2R0	33
				d2R0	179
				f3R0	46
				f3R0	1141
			Belman	d2RI	325
				D2R0	179
				d2RI	185
			Piccadilly	b4R0	358
				C2R0	46
				c2R0	312
				c2R0	238
				D3R0	6
				d2R0	212
				E3R0	6
				F3R0	59
				f2R0	6
				f3R0	6
					4832
	Steep slopes, stoniness	Medium	Port au Port	c3RI	6
				D2R2	99
				d3RI	59
				f3RI	26
			Costa	D2RI	26
				d2RI	172
				F2R2	59
				f2R2	305
			Hardwood	d2RI	132
				f2RI	146
					1367

Table 8. Soils in land use capability Class 5 (suitable for grazing and forestry)

Land use capability	Limitations	Texture	Soil series, topography and stoniness + rockiness		Hectares
	Steep slopes, imperfect and poor drainage	Moderately coarse	Lead	F3R0	33
				f3R0	13
			West Bay	F3R0	26
				F3R1	66
				f1R1	165
				f3R0	72
			Winterhouse Tea Cove	f1R0	26
				c0R0	13
				c1R0	19
				c2R0	39
				d1R0	53
				d2R0	59
				f1R0	66
			Salmon Cove	c0R0	19
				c1R0	13
				c2R0	53
				d1R0	19
					762
	Imperfect drainage, low fertility	Coarse	Black Duck Brook	c3R0	106
			Three Rock Cove	C0R0	66
					172
Total area, Class 5					7134

Table 9. Soils in land use capability Class 7 (unsuitable for agriculture)

Land use capability	Limitations	Texture	Soil series, topography and stoniness + rockiness		Hectares
Very stony, steep, rocky, shallow or swampy land; mainly useful for wildlife and forestry.	Steep slopes, stoniness, shallow bedrock adverse subsoil structure, excessive wetness	Fine	Abraham	f3R2	497
				f4R2	1241
				f4R3	265
				G4R3	13
				g4R2	265
				g4R3	53
			Shoal Point	b0R0	404
				c0R0	72
				c2R0	624
				d0R0	285
				e2R0	13
					3736
		Moderately fine	Long Point	d4R2	33
				f4R2	26
				f4R4	46
			Mainland	D0R0	79
				D2R0	86
				d2R0	119
				e2R0	26
				f3R0	484
			Aguathuna	B0R0	59
				C0R0	530
				D0R0	458
				E0R0	13
					1965
	Steep slopes, stoniness and rockiness	Medium	Port au Port	c3R3	53
				D3R2	165
				D3R3	292
				d2R3	99
				E3R2	159
				E3R3	26
				E3R4	26
				e3R2	59
				F2R3	298
				F3R3	232
				F3R4	292
				F4R4	33

Table 9. Soils in land use capability Class 7 (unsuitable for agriculture)

Land use capability	Limitations	Texture	Soil series, topography and stoniness + rockiness		Hectares
				f2R3	497
				f3R3	298
				f4R3	232
				G3R3	152
				G4R3	93
				G4R4	6
				g3R3	318
				g3R4	464
				g4R4	26
				H4R4	6
			Costa	C2R4	13
				D2R3	59
				D2R4	597
				d2R3	424
				d2R4	471
				E2R3	86
				E3R3	6
				e2R3	53
				F2R3	212
				F2R4	13
				F3R4	79
				f2R3	265
				f2R4	484
				G2R3	26
				g3R3	93
				g3R4	19
				g4R4	6
				g3R2	597
					7348
	Steep slopes, stoniness	moderately coarse	West Bay	g3R2	33
					33
Total area, Class 7					13 083

Steep slopes and moderately severe erosion restrict the use of the West Bay and Winterhouse soils to permanent pasture when they are cleared, limed, fertilized, and seeded to grass.

The coarse-textured soils of Tea Cove, Black Duck Brook, and Salmon Cove release water to plants very slowly. The Tea Cove and Black Duck Brook soils are imperfectly drained and low in fertility. They could be improved and used as permanent pasture. The Salmon Cove soils are also limited by extreme wetness and are best left in forest. Some areas could be improved and used for permanent pasture.

The Three Rock Cove soils are extremely droughty and low in fertility. They are best left in forest, but can be cleared and used for permanent pasture.

In general, the soils in Class 5 are not considered suitable for cultivation. Forestry is their best use. The soils in this class occupy about 18.6% of the Peninsula.

There are no soils in the area that meet the requirements of Class 6. No areas of wild pasture capable of providing sustained grazing capacity for farm animals without some form of improvement have been found. Any small areas that might be improved were placed in Class 5. Soils that could not be improved were placed in Class 7.

Soils that have such severe limitations that they are unsuitable for arable agriculture or permanent pasture are placed in Class 7 (Table 9). The soils in Class 7 include very steep, stony, and rocky land, and wet land. The soils may or may not have a high capability for the growth of trees, native fruits, wildlife, or recreation. Most of the Class 7 land on the Port au Port Peninsula is suitable only for wildlife. Some is suitable for forestry as well.

The Shoal Point soils are limited by wetness and poor aeration. The Aguathuna and Mainland soils are limited by wetness, undesirable soil structure, and low permeability. All the other Class 7 soils are limited by rockiness, stoniness, steep slopes, or any combination of these factors.

The Class 7 soils occupy about 34% of the land area of the Peninsula, and they occur mainly in the highland regions.

The soil capability classification is not applied to the organic soils because there is not enough information on which to base interpretive judgment of their capabilities. Organic soils are designed on the soil capability map by the letter "O" alone.

CROP ADAPTABILITY RATINGS

In the above discussion, the soils were grouped according to the characteristics that limit their use. Where soils are suitable for crops, they vary widely in their ability to produce specific crops because of the inherent factors of natural fertility and physical composition. Crop yields are the best measure of this ability, but data are difficult to obtain in the Port au Port Peninsula.

Management is an important factor in production. A poor soil under good management may yield as well as, or better than, good soils under poor management. In some cases, changes in management practices might produce better yields at the same cost. Usually the yields observed in an area over a period of years represent the range to be expected under the prevailing systems of management. Unfortunately, reliable figures for yields on the various soil types are not available.

The ratings of the soils for specific crops (Table 10) are based mainly on observations made during the survey and on a knowledge of the soil characteristics. Soils that are suited to a variety of crops are rated higher than those adaptable to only a few crops. Certain soils may be extremely valuable for a particular crop if conditions are favorable, but may have a low rating for general suitability. The ratings apply to those areas of each soil that are suitable for cultivation. The soils were grouped into four classes, ranging from excellent to poor crop land.

The major differences in the soils of the surveyed area are related to variations in texture, topography, drainage conditions, and the degree of stoniness and rockiness. These conditions are reflected in soil moisture availability, drainage, fertility, erodibility, and hindrance to cultivation.

When a soil has all the moisture it can hold against the pull of gravity, it is said to be at field capacity. The available soil moisture is the difference between the moisture at field capacity and at a point low enough to permit wilting.

Coarse-textured or sandy soils hold small amounts of available moisture and tend to become dry during the summer. Fine-textured or clayey soils hold the most water at field capacity, but less of the water is available to plants. Medium-textured or loamy soils absorb fairly large amounts of water and therefore have more water available for plant use than do either the sands or the clays. Fine-textured soils at field capacity may have poor aeration and be unsuitable for plant growth.

Table 10. Ratings of soils in Classes 3 and 4 for selected crops*

Series	Hectares	Hay	Pasture	Potatoes	Vegetables
Class 3 (good to fair crop land)					
Lead	491	G	E-G	G-F	G-F
Class 4 (fair to poor crop land)					
Boswarlos	93	P	F-P	P	P
Hardwood	305	F	G-F	F-P	F-P
Lead	13	G-F	E-G	F	F
Long Point	285	F-P	F	P	P
Lourdes	212	G-F	G	F	F
Port au Port	106	F	G-F	F-P	F-P
Round Head	79	F-P	F	P	P
West Bay	682	F	G-F	F	F
Winterhouse	165	F	G-F	F	F

*E, excellent; G, good; F, fair; P, poor.

Note: Class 5 soils are unsuitable for cultivation and Classes 6 and 7 soils are unsuitable for agriculture.

If soils are poorly drained, a method of removing water is necessary before crop production is practical. If the soils have high natural fertility or market conditions are especially favorable, it may be profitable to install tile drains. In very fine-textured soils the cost would be high, and surface drains would be more practical. The drainage of such soils favors the decomposition of accumulated organic matter. One of the beneficial results of drainage is the increase of nitrogen available for plant use.

The natural fertility of the soil is influenced to some extent by texture. In open, sandy soils the percolation of water removes nutrients rapidly. The finer textured soils are not so readily leached and contain more material that acts as an exchange complex. They are usually acid at the surface and require liming. Crops grown in the surveyed area should respond to applications of phosphorus, which is one of the major elements lost in leaching.

The erodibility of the soils depends on cover, texture, degree and length of slope, and amount of organic matter. Practically all the erosion that takes place on the Peninsula is caused by water. In sandier soils, water is absorbed more readily and the run-off is less than in fine-textured soils on similar slopes. However, the same amount of water dislodges particles more easily from coarse-textured soils. To prevent erosion, it is necessary to slow the flow of water over the surface. Where the soils are cultivated, this may be accomplished by working across, instead of up and down, the slopes.

PHYSICAL AND CHEMICAL COMPOSITION OF THE SOILS

The physical and chemical analyses of the major soil types of the Peninsula (Tables 11 and 12) give some idea of the range in composition of the soils of the area and the processes that have taken place during soil development. The pH values are used to estimate soil acidity. They have been determined in both water and calcium chloride for comparison. The pH determined in calcium chloride is generally lower than that determined in water. Exchangeable acidity, exchangeable bases, and percentage of base saturation are correlated with one another and with the pH. The four factors aid in determining the quantity of lime that must be added to the soil to bring about a rise in pH. The percentage of ignition loss gives an estimate of the amount of organic matter contained in the soil. The analyses for available nutrients (Table 13) give an indication of the part of the total nutrient supply immediately available to plants. This supply may vary with location, time of sampling, and treatment after sampling, so that the figures are only a general guide in predicting crop responses.

All the soils are acid in reaction in the upper part of the profile and evidently need lime. The surface horizon in the Lead soils is neutral in reaction, and the location where the sample was taken has probably been limed. The Aguathuna, Piccadilly, Boswarlos, and Abraham soils have some accumulated free carbonate in the lower part of the profile and are neutral in the C horizon.

The podzolization process is indicated by the accumulation of iron, aluminum oxides, and organic matter in the B horizon, and the presence of a highly siliceous and bleached-looking Ae horizon. This process is more pronounced in sandy soils than in soils developed from fine-textured materials. In Luvisolic soils, an increase in clay is noticeable in the B horizon.

In general, the Piccadilly and Shoal Point soils are relatively high in available potassium and calcium, as are their parent materials. The Salmon Cove soils are relatively high in available calcium and the Round Head soils in available potassium. The fine-textured soils have a greater proportion of available nutrients than the coarser-textured soils because they contain larger amounts of clay, which acts as an exchange complex. The supply of nutrients increases with depth. The high availability of phosphorus is related to a high organic matter content and high pH values.

In physical composition, the soils range from loamy sand to clay (Fig. 5). Usually, soils that contain more than 27% clay have moderately slow to slow water movement through the profile. These soils require careful management. They should be plowed and cultivated when moisture conditions are optimum in order to preserve the structure; otherwise, the soil will puddle when wet and bake hard when dry, making it difficult to establish good tilth. A fairly high silt content seems to be common in many of the Podzolic soils in the map areas, except where the parent material is sandy.

AVAILABLE NUTRIENTS

The supply of available major nutrients in the soils (Table 13) is important in crop production. In general, the supply tends to increase with depth in the profile as a natural result of leaching. The availability of nutrients may be high in undisturbed surface layers where organic matter acts as an exchange complex. There may be considerable variation in the supply of available elements between soils of the same series. Most soils on the Peninsula are acid in reaction and deficient in available nutrients. The coarse-textured soils contain lesser amounts of available nutrients than the fine-textured soils. All the soils require high rates of fertilizer and lime to produce maximum crop yields.

The number of hectares of the various soil series and mapping units are presented in Table 14.

Table 11. Physical and chemical composition of the soils

ABRAHAM

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	F	13-0	92.2	3.9	2.8				
2	Ae	0-3	3.5	4.2	3.5	1.25	18.0	35.0	47.0
3	Bm1	3-11	3.9	4.5	4.0	0.96	13.47	41.57	44.96
4	Bm2	11-25	4.4	4.9	4.5	1.10	13.0	43.0	44.0
5	Ck	25-45	5.0	6.7	6.6	1.34	10.0	47.0	43.0

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1																	
2	0.26	3.36	2.30	4.53	13.3	4.8	26.5	3.8	0.3	0.3	0.3	0.24	0.09	9	1.5	14	0
3	0.28	4.54	2.71	3.00	14.0	5.5	28.2	4.6	0.4	1.1	0.5	0.51	0.16	15	0.3	4	5
4	0.36	5.74	3.00	0.88	12.2	7.6	38.4	5.0	0.6	1.0	0.7	0.52	0.21	5	0.3	8	10
5	0.39	14.67	2.71	0	4.5	19.1	80.4	5.5	0.7	1.0	0.8	0.40	0.21	5	0.8	6	20
														5	0.3	6	120

Table 11. Physical and chemical composition of the soils

AGUATHUNA

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	Of+Om	20-0	96.1	4.0	2.7				
2	Aeg	0-8	5.2	4.2	3.2		29.0	32.0	39.0
3	Btgf	8-20	2.9	5.3	4.1	0.73	25.18	31.14	43.68
4	Cg	20-56	3.2	6.8	5.9		24.0	43.0	33.0
5	Ckg	56+	2.9	7.6	6.8		26.0	45.0	29.0

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1																	
2					12.8	3.1	19.5	0.28	0.2	0.08	0.3			5	0.4	7	5
3	0.35	7.73	4.11	0.14	8.5	10.3	54.8	1.4	0.4	1.0	0.5	0.18	0.11	5	0.4	3	5
4					4.5	16.2	78.3	2.9	0.2	0.37	0.3			4	0.4	5	30
5					0	23.4	100.0	0.88	0.1	0.28	0.2			5	0.3	4	70
														4	0.5	4	180

Table 11. Physical and chemical composition of the soils

BELMAN

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	L-H	20-0	88.3	4.7	3.7				
2	Aeg	0-4	5.2	5.4	4.0				
3	Bg	4-27	2.6	5.3	4.4	0.61	22	44	34
4	Cg	27+	2.9	6.7	6.2		28	40	32
							28	40	32

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1														8	1.6	22	15
2														5	0.3	2	20
3	0.20	4.17	3.10	0.44	12.2	10.0	45	0.14	0.2	0.11	0.3			3.5	0.3	4	15
4					9.9	8.1	45	3.9	0.4	1.2	0.4	0.26	0.11	5	0.3	5	30
					7.9	11.7	59.7	3.4	0.2	0.7	0.3						

Table 11. Physical and chemical composition of the soils

BLACK DUCK BROOK

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	L-H	8-0	85.0	4.0	3.3	9.0			
2	Ae	0-20	2.6	4.6	3.8	1.4	51	40	9
3	Bf	20-38	4.1	5.2	4.2	2.6	65	29	6
4	C	38-56	0.9	5.3	4.5	2.0	80	17	3

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1																	
2					8.6	0	0	0.59	0.3	0.8	0.4			7	0.4	10	5
3					14.4	0	0	2.9	0.3	1.3	2.3			4	1.0	2	0
4					8.8	0	0	0.7	0.6	0.6	1.0			4	0.5	2	0
														3	0.4	2	0

Table 11. Physical and chemical composition of the soils

COSTA

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	Ae	0-8	2.3	4.4	3.8	0.91	34.31	63.84	1.85
2	Bf1	8-13	2.3	4.5	3.7	0.76	35.32	32.89	31.79
3	Bf2	13-28	4.1	5.1	4.2	1.33	44.14	28.23	27.63
4	Bf3	28-53	6.5	5.2	4.5	1.90	19.0	55.0	26.0
5	C	53+	5.0	5.6	4.8	1.71	8.0	75.0	17.0

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1	0.11	0.60	0.82	2.14	17.8	1.5	7.8	1.4	0.2	0.7	0.2	0.22	0.05	1.5	0.5	2	5
2	0.16	1.06	1.29	2.37	15.2	4.7	23.9	3.6	0.5	1.5	0.4	0.56	0.10	1.5	0.5	2	5
3	0.21	1.92	2.28	1.38	15.0	5.8	27.9	3.6	0.9	2.0	0.8	0.83	0.23	1.5	0.5	3	15
4	0.30	2.32	2.30	1.08	17.0	5.8	25.4	4.6	1.9	2.7	1.4	0.96	0.52	1.0	0	4	20
5	0.27	3.67	2.35	0.24	12.0	7.1	37.2	4.3	1.4	1.4	1.1	0.47	0.44	1.5	0	4	25

Table 11. Physical and chemical composition of the soils

CROW HEAD

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	Aegj	0-13	5.8	4.3	3.6	2.65	14.62	53.28	32.10
2	Aeg	13-23	3.5	4.6	4.0	1.49	54.13	19.33	26.54
3	Btg1	23-33	3.5	4.9	4.3	0.69	21.0	47.0	32.0
4	Btg2	33-46	2.9	4.6	4.3	0.40	14.0	48.0	38.0
5	Cg	46+	2.6	5.3	4.4	0.34	25.89	20.29	53.82

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation %	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1	0.22	0.44	1.34	9.89	28.2	4.2	13.0	0.7	0.4	0.7	0.5	0.29	0.14	1.5	0.5	2	5
2	0.16	0.66	2.14	7.35	15.8	4.2	21.0	1.8	0.5	1.4	0.6	0.50	0.19	1.5	0.5	3	5
3	0.29	1.65	4.92	6.72	23.8	8.6	26.5	1.8	0.6	1.5	0.7	0.21	0.18	1.0	0.5	5	5
4	0.42	3.04	6.88	5.67	21.8	10.5	32.5	1.4	0.6	1.3	0.6	0.12	0.14	2.0	0	6	5
5	0.35	4.26	7.41	2.92	20.2	12.4	38.0	1.4	0.5	1.3	0.6	0.11	0.11	1.5	0	5	10

Table 11. Physical and chemical composition of the soils

LEAD

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	Ap	0-25	18.6	7.1	6.0	10.28	48	39	13
2	Ae	25-33	2.9	5.6	3.9	1.97	51	38	11
3	Bf	33-63	3.2	5.4	3.7	3.98	61	34	5
4	C	63+	1.7	5.1	3.8	0.91	71	22	7

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation %	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1	0.17	26.45	6.58	0	2.9	23.1	82.8	0.93	0.6	0.84	0.8	0.54	0.27	8	0.4	2	120
2	0.04	3.57	1.94	0.12	7.7	4.2	35.3	0.7	0.2	0.23	0.2	0.26	0.09	8	0.4	1	25
3	0.05	1.46	0.69	0.88	16.9	2.0	10.6	3.8	2.3	1.50	2.5	1.13	1.18	5	0.3	1	20
4	0.05	0.23	0.21	0.39	7.0	0	0	0.5	0.6	0.2	1.1	0.12	0.45	4	0.3	1	24

Table 11. Physical and chemical composition of the soils

LONG POINT

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	F-H	6-0	84.1	4.2	3.5				
2	Aegj	0-9	2.6	4.9	3.9		27	62	11
3	Bf	9-32	7.0	5.8	5.0		33	53	14
4	C	32-86	2.6	6.3	5.4		25	43	32

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1																	
2					11.3	0.6	5.0	0.6	0.2	0.7	0.2			7	1.0	19	9
3					12.1	11.1	47.8	4.3	1.0	1.9	1.2			5	0.7	1	5
4					7.4	0	0	2.5	0.4	0.6	0.4			6	0.3	4	35
														3	0.9	5	30

Table 11. Physical and chemical composition of the soils

LOURDES

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	Ae	0-8	3.2	4.2	3.5	1.22	27	62	11
2	Bf1	8-25	7.9	4.8	4.1	2.66	25	64	11
3	Bf2	25-51	4.0	6.1	5.2	1.53	33	56	11
4	C	51+	2.0	6.7	6.1	0.48	31	48	21

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation %	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1	0.08	0.20	0.53	1.56	14.0	2.8	16.7	0.9	0.1	0.3	0.1	0.18	0.03	1.5	0.5	3	5
2	0.11	1.03	1.11	1.68	23.8	2.6	9.8	3.9	1.4	3.4	1.0	1.22	0.41	3.5	0.5	3	5
3	0.11	2.25	0.90	0.06	12.4	4.2	25.3	2.5	1.5	1.5	1.2	0.52	0.55	1.5	0.5	3	45
4	0.18	6.54	1.34	0	8.6	8.7	50.3	2.5	0.5	1.0	0.4	0.14	0.07	6.5	0.5	3	60

Table 11. Physical and chemical composition of the soils

MAINLAND

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	Ae	0-8	12.2	4.4	3.7		11	45	44
2	Aegj	8-18	5.2	4.7	3.9		20	41	39
3	Btgf	18-30	3.2	4.5	4.1		11	33	56
4	Cg1	30-61	3.2	5.7	4.6		8	52	40
5	Cg2	61+	2.9	5.8	5.3		5	57	38

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1					24.6	4.7	16.0	0.2	0.3	0.2	0.3			1.5	0.5	2	5
2					21.6	5.0	18.8	0.5	0.3	0.4	0.4			3.0	0.5	3	5
3					17.6	10.0	36.2	3.3	0.4	1.8	0.6			1.5	0.5	7	15
4					13.0	18.5	58.7	1.8	0.4	0.8	0.5			1.5	0.5	5	20
5					10.8	22.0	67.1	1.8	0.4	0.7	0.4			1.0	0.5	4	30

Table 11. Physical and chemical composition of the soils

PICCADILLY

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	Of-Oh	25-0	56.6	4.0	3.0				
2	Bg	0-15	1.4	6.0	4.7	0.94	40	35	25
3	Ckg	15-60	2.9	7.6	6.6	0.08	25	45	30

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1														3.5	0.5	6	10
2	0.27	5.94	1.25	0	6.3	7.4	54.0					0.12	0.08	5	0.2	8	45
3	0.37	9.53	0.95	0	0	19.6	100.0					0.04	0.02	5	0.3	13	190

Table 11. Physical and chemical composition of the soils

PORT AU PORT

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	F	5-0	88.4	3.8	3.3				
2	Ae	0-4	3.2	3.8	3.3	1.55	59.07	25.27	15.66
3	Bf	4-19	4.9	4.8	4.1	1.86	47.04	29.09	23.87
4	C	19-50	2.6	5.5	4.6	0.89	50.00	28.79	21.21

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1														7	1.8	22	5
2	0.14	0.80	0.73	3.33	13.3	0.3	2.2	0.61	0.1	0.17	0.2	0.15	0.06	7	0.5	4	5
3	0.13	0.51	0.69	3.24	16.7	1.0	5.6	4.60	0.8	1.4	1.0	0.95	0.39	6	0.4	4	5
4	0.14	3.67	0.98	0.28	8.1	3.6	30.8	0.93	0.8	0.6	1.1	0.25	0.26	3	0.5	5	25

Table 11. Physical and chemical composition of the soils

ROUND HEAD

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	Ae	0-3	5.8	4.5	3.8	2.44	29.27	53.50	17.23
2	Bt1	3-23	6.5	4.9	4.2	2.00	15.13	50.34	39.53
3	Bt2	23-43	3.8	5.1	4.4	0.88	9.20	53.14	37.66
4	C	43+	2.6	5.2	4.4	0.36	8.76	57.39	33.85

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1	0.26	1.32	1.82	4.92	19.6	5.0	20.3	0.6	0.2	0.3	0.3	0.15	0.08	1.5	1.0	3	5
2	0.42	1.59	2.30	3.54	21.8	2.0	8.4	2.9	0.8	2.2	0.8	0.92	0.27	2.0	0.5	8	5
3	0.64	1.39	3.10	2.54	19.8	6.0	23.3	1.8	0.7	1.5	0.7	0.42	0.21	1.5	0.5	20	5
4	0.31	0.97	2.42	2.78	18.0	4.7	20.7	1.1	0.5	0.8	0.5	0.14	0.16	1.0	0.5	10	5

Table 11. Physical and chemical composition of the soils

SALMON COVE

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	Bgj	0-10	10.0	6.1	5.4		17	53	30
2	Bg	10-30	2.3	6.2	5.5		36	47	17
3	C	30+	1.1	6.1	5.2		67	24	9

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1					13.8	23.8	63.3	2.1	0.7	1.5	1.1			2.5	0.5	2	80
2					10.4	10.0	49.0	1.4	0.4	1.0	0.5			1.5	0.5	3	45
3					9.4	7.3	43.7	1.0	0.4	0.7	0.5			1.5	0.5	2	30

Table 11. Physical and chemical composition of the soils

SHOAL POINT

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	Aeg	0-10	10.6	4.7	3.8	5.50	8.04	27.89	64.07
2	Bg	10-23	2.1	6.0	5.1	0.91	16.97	34.58	48.45
3	C	23-51	2.3	6.8	6.2	0.36	0.25	77.59	22.16

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1	0.48	6.69	6.70	2.31	25.6	14.3	35.8	0.2	0.4	0.2	0.5	0.14	0.30	1.5	0.5	6	25
2	0.56	6.34	6.36	0.02	12.2	15.1	55.3	0.8	0.1	0.3	0.3	0.07	0.08	1.0	0.5	13	30
3	0.53	9.63	6.44	0	10.4	19.9	65.7	2.5	0.2	0.4	0.2	0.04	0.03	0.5	0	7	45

Table 11. Physical and chemical composition of the soils

TEA COVE

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	Aegj	0-10	8.5	4.5	3.9	3.70	49.78	21.54	25.68
2	Bf1	10-25	3.8	5.0	4.3	2.09	65.77	12.16	22.07
3	Bf2	25-38	2.6	5.3	4.4	0.92	64.0	25.0	11.0
4	BC	38-41	2.9	5.3	4.6	0.71	56.0	34.0	10.0
5	C	41-66	2.0	6.3	5.5	0.65	81.93	4.18	13.89

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1	0.28	0.71	1.50	5.29	21.8	2.8	11.4	3.6	0.8	2.7	0.8	0.92	0.25	6.5	0	5	5
2	0.19	0.46	0.94	2.87	18.6	2.8	13.1	2.5	1.5	2.2	1.3	0.66	0.49	6.0	0.5	4	5
3	0.18	0.88	1.36	1.53	16.4	3.1	15.4	2.1	1.2	1.3	1.0	0.30	0.35	2.5	0	4	5
4	0.36	1.70	2.14	0.03	16.2	4.2	20.6	1.8	2.1	1.5	1.5	0.10	0.24	3.0	0	5	5
5	0.16	0.43	1.46	0	10.0	4.6	43.2	1.8	0.5	0.7	0.6	0.17	0.14	1.5	0	4	35

Table 11. Physical and chemical composition of the soils

WEST BAY

	Horizon	Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	F-H	4-0	59.8	4.6	3.8				
2	Ae	0-5	1.2	4.6	3.9	0.73	67.68	24.44	7.88
3	Bf1	5-9	7.8	4.9	4.1	3.15	62.10	11.52	28.38
4	Bf2	9-19	5.5	4.9	4.2	3.07	49.33	22.67	28.00
5	BC	19-36	3.2	5.2	4.4	1.79	83.47	5.77	10.76
6	C	36+	2.6	4.9	4.2		54.95	18.59	26.46

	Exchangeable (meq/100 g soil) K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available nutrients (mg/kg) N	P	K	Ca
1														7	1.4	24	10
2	0.13	0.59	0.60	0.62	7.7	0.7	8.3	0.3	0.04	0.07	0.1	0.06	0.04	5	0.4	6	5
3	0.17	2.62	3.05	0.42	20.9	4.5	17.7	7.3	1.1	3.2	1.4	2.06	0.55	4	0.3	3	5
4	0.20	2.20	3.20	3.46	18.0	4.1	18.6	4.6	0.9	1.8	1.2	1.64	0.59	5	0.3	3	10
5	0.12	0.75	1.17	1.95	11.3	1.8	13.7	0.9	0.1	0.6	1.0	0.63	0.54	4	0.3	4	5
6					12.6	3.4	21.3	0.8	0.4	0.6	0.6	0.22	0.20	8	0.3	6	5

Table 11. Physical and chemical composition of the soils

			WINTERHOUSE						
Horizon		Depth (cm)	Loss on ignition	pH H_2O	pH $CaCl_2$	Organic carbon (%)	Particle-size distribution* (%) Sand	Silt	Clay
1	F	6-0	45.4	4.8	4.1				
2	Ae	0-6	1.7	4.8	4.0	1.12	72.44	18.26	9.30
3	Bfj	6-18	3.8	5.1	4.3	2.23	73.33	7.39	19.58
4	C	18+	2.0	5.5	4.6	0.63	90.65	2.02	7.33

	Exchangeable (meq/100 g soil)																Available nutrients (mg/kg)			
	K	Ca	Mg	Al	Acidity	Sum bases	Base saturation (%)	Percentage extractable by: Dithionite Fe	Dithionite Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	N	P	K	Ca
1														6	1.0	17	5
2	0.11	0.49	1.24	0.40	7.4	1.0	11.9	0.54	0.1	0.06	0.1	0.05	0.03	6	0.3	3	0
3	0.19	2.76	8.55	2.30	15.1	8.5	36.0	7.2	0.4	0.8	0.7	0.72	0.28	5	0.3	5	5
4	0.15	2.71	7.10	2.25	12.1	9.0	42.7	0.83	0.4	0.2	0.2	0.14	0.32	4	0.4	5	5

*Gravel (>2 mm in diameter) if reported is expressed as percentage of whole soil. The remainder (sand, silt and clay) is expressed as percentage of fine earth (that fraction of whole soil <2 mm in diameter). Sand is 2-0.05 mm, silt is 0.05-0.002 mm, and clay is <0.002 mm in equivalent diameter.

Table 12. Physical composition of the sand fraction of selected horizons

Soil	Horizon	2-1 mm (%)	1-0.5 mm (%)	0.5-0.25 mm (%)	0.25-0.1 mm (%)	0.1-0.05 mm (%)
Abraham	Bm	4.31	2.37	0.84	1.51	4.45
Aguathuna	Btgf	2.62	3.02	3.17	7.30	9.03
Boswarlos	Ae	8.50	10.00	5.59	5.88	8.49
	Btg1	8.34	9.51	6.76	6.16	6.84
	Btg2	4.60	5.61	4.02	5.56	6.26
	BC	7.12	7.91	8.55	8.18	7.78
	Cca	3.17	4.27	4.15	8.53	6.61
Costa	Ae	1.35	3.86	4.53	10.18	14.40
	Bf1	2.43	6.65	6.49	10.60	9.14
	Bf2	3.85	4.81	4.92	13.57	17.00
Crow Head	Aegj	3.43	1.13	9.34	4.77	4.35
	Aeg	0.39	0.61	4.13	29.97	19.02
	Cg	0.20	0.90	2.50	10.72	11.56
Port au Port	Ae	5.16	7.66	8.82	13.98	23.45
	Bf	4.17	6.99	8.40	13.13	14.35
	C	3.11	6.79	7.81	9.81	21.11
Round Head	Ae	2.88	2.39	1.65	5.04	17.30
	Bt1	1.92	1.32	1.23	2.61	8.06
	Bt2	0.36	0.71	0.81	1.70	5.63
	C	0.19	0.42	0.49	1.85	5.81
Shoal Point	Aeg	0.87	2.93	1.31	1.78	1.15
	Bg	2.93	3.48	3.22	4.80	2.54
Tea Cove	Aegj	5.58	16.04	12.70	9.20	6.26
	Bf	9.53	24.12	16.97	9.53	5.62
	C	8.66	28.90	30.83	10.10	3.45
West Bay	Ae	6.80	14.42	16.13	19.01	11.32
	Bf1	18.73	15.84	6.84	12.57	6.12
	Bf2	1.64	3.33	3.75	32.76	7.85
	BC	0.41	0.66	3.95	73.04	5.40
	C	0.49	0.51	1.39	39.34	13.22
Winterhouse	Ae	1.36	4.35	10.74	29.85	26.13
	Bfj	1.03	3.45	15.70	31.47	21.67
	C	2.43	6.84	22.30	45.05	14.04

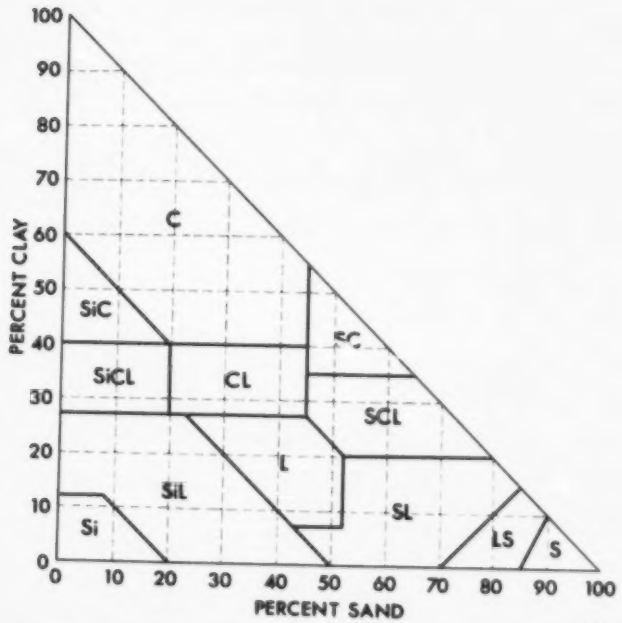

Fig. 5. Percentages of clay and sand in the main textural classes of soils; the remainder of each class is silt.

Table 13. Available nutrients* (in kilograms per hectare) in soils of the Port au Port Peninsula

Series	Depth (cm)	N	P	K	Ca
Abraham	0-3	22.4	0.4	5.6	7.8
	3-11	25.7	1.6	41.4	52.7
	11-25	41.4	6.6	49.3	164.7
	25-45	59.4	3.6	71.7	1484.6
Aguathuna	0-8	22.4	1.8	13.4	22.4
	8-20	30.2	3.0	36.9	224.2
	20-55	104.3	6.3	76.1	1457.3
	55+	84.1	10.4	76.1	3766.5
Belman	0-4	11.2	0.7	5.5	44.8
	4-27	47.0	4.0	53.8	201.7
	27+	44.8	2.7	44.8	269.0
Black Duck Brook	0-20	48.2	12.3	23.5	<1
	20-38	41.4	5.3	21.3	<1
	38-56	36.9	4.1	21.3	<1
Boswarlos	0-3	2.2	1.1	3.4	7.8
	3-10	6.7	2.2	8.9	44.8
	10-30	17.9	5.6	76.1	238.7
	30-76	40.4	13.4	134.5	1076.2
	76+	13.5	4.5	63.8	1972.9
Costa	0-8	2.2	1.1	3.4	7.8
	8-13	8.9	3.9	12.3	30.2
	13-28	13.4	4.5	26.9	134.5
	28-53	14.5	0	59.4	299.3
	53+	13.4	0	35.8	224.2
Crow Head	0-13	11.2	3.4	14.5	36.9
	13-23	8.9	3.4	17.9	30.2
	23-33	5.6	3.4	30.2	30.2
	33-46	14.5	0	44.8	36.9
	46+	13.4	0	44.8	89.7
Lead	0-25	118.8	5.9	30.2	1793.6
	25-33	35.8	1.8	4.5	112.1
	33-63	89.6	5.4	17.9	358.7
	63+	35.8	2.7	8.9	<1
Long Point	0-9	25.7	3.9	4.5	25.7
	9-31	80.7	4.0	53.8	470.8
	31-86	96.4	29.1	160.3	964.0

Table 13. Available nutrients* (in kilograms per hectare) in soils of the Port au Port Peninsula

Series	Depth (cm)	N	P	K	Ca
Lourdes	0-8	6.7	2.2	3.4	22.4
	8-25	36.9	8.6	3.4	52.7
	25-51	22.4	7.8	44.8	672.6
	51+	58.3	4.5	26.9	538.1
Mainland	0-8	6.7	2.2	8.9	22.4
	8-18	17.9	3.4	17.9	30.2
	18-30	11.2	3.4	52.7	112.1
	30-61	26.9	8.9	89.7	358.7
	61+	8.9	4.5	35.9	269.0
Piccadilly	0-15	44.8	1.8	71.7	403.5
	15-60	44.8	2.7	116.5	1703.9
Port au Port	0-4	15.7	1.1	8.9	11.2
	4-19	53.8	3.6	35.8	44.8
	19-50	65.1	9.3	93.0	455.1
Round Head	0-3	2.2	1.1	4.8	7.8
	3-23	30.2	5.6	95.2	59.4
	23-43	17.9	5.6	238.7	59.4
	43+	8.9	4.5	95.2	44.8
Salmon Cove	0-10	14.6	3.4	12.3	477.5
	10-30	17.9	5.6	35.8	538.0
	30+	13.4	4.5	17.9	269.0
Shoal Point	0-10	8.9	3.4	35.9	149.1
	10-23	7.8	3.4	97.5	224.2
	23-51	4.5	0	62.8	403.5
Tea Cove	0-10	39.2	0	30.2	30.2
	10-25	53.8	4.5	35.8	44.8
	25-38	19.0	0	30.2	36.8
	38-41	4.5	0	7.8	7.8
	41-66	22.4	0	59.4	522.3
West Bay	0-5	14.6	1.2	17.9	14.6
	5-9	8.9	0.7	6.7	11.2
	9-19	30.2	1.8	17.9	59.4
	19-36	41.5	3.1	41.5	52.7
	36+	71.7	2.7	53.8	44.8
Winterhouse	0-6	22.4	1.1	11.2	<1
	6-18	33.6	2.0	33.6	33.6
	18+	35.8	3.6	44.8	44.8

*Available nutrients were calculated on the basis of 2 240 000 kg/ha for a 15-cm depth.

Table 14 Area of map units

Map Unit	Area (ha)	Percentage of total area
Abraham	3306	8.7
Aguathuna	1060	2.8
Belmon	692	1.8
Black Duck Brook	105	0.3
Big Cove	431	1.1
Boswarlos	344	0.9
Campbells Cove	431	1.1
Clam Bank Cove	756	1.9
Coastal Beach	54	0.1
Colntres Brook	597	1.5
Costa	4075	10.6
Crow Head	1400	3.6
Felix Cove	331	0.3
Hardwood	1039	2.7
Jerrys Nose	106	0.3
Lead	550	1.4
Long Point	392	1.0
Lourdes	212	0.6
Mainland	797	2.1
Marches Point	8255	21.5
Pigeon Head	286	0.7
Piccadilly	1275	3.4
Port au Port	4136	10.7
Quarries	65	0.2
Red Island	40	0.1
Rock Land	3650	9.6
Round Head	344	0.9
Salmon Cove	105	0.3
Sheaves Cove	168	0.5
Ship Cove	382	1.0
Shoal Point	1400	3.7
Tea Cove	251	0.7
Three Rock Cove	58	0.2
Water (lakes, ponds)	127	0.3
West Bay	1121	2.9
Winterhouse	192	0.5
Total	38 533	100.0

METHODS OF ANALYSIS

Reaction (pH): Glass electrode -- 10 g soil in 20 mL 0.01M $CaCl_2$ (pH $CaCl_2$); also 10 g soil in 10 mL water (pH water).

Particle-size analysis: Hydrometer method. Bouyoucos (1936).

Hygroscopic moisture: Heating at 105°C until the weight remained constant.

Loss on ignition at 450°C: Method of Atkinson et al. (1958).

Oxalate extractable Fe and Al: Extracted in ammonium oxalate as described by McKeague and Day (1966).

Dithionate extractable Fe and Al: Dithionate-citrate-bicarbonate method of Mehra and Jackson (1960).

Pyrophosphate Fe and Al: Method of McKeague (1967).

Exchangeable acidity: Soil leached with 1 N ammonium acetate, to pH 7.0, back-titrated to original pH. Atkinson et al. (1958).

Exchangeable bases: Soil leached with 1 N ammonium acetate, leachate evaporated to dryness, ignited, dissolved in HCl, back-titrated with NaOH. Jackson (1958).

Available nutrients: Soil shaken with 0.025 N acetic acid according to Spurway (1933).

LIST OF COMMON PLANTS

alder, speckled	Alnus rugosa (Du Roi) K. Spreng.
ash, mountain	Sorbus americana Marsh.
baked-apple or cloudberry	Rubus chamaemoris L.
birch, white	Betula papyrifera Michx.
blueberry	Vaccinium angustifolium Ait.
bog-rosemary	Andromeda glaucophylla Link
bunchberry	Cornus canadensis L.
burnet, Canadian	Sanguisorba canadensis L.
cherry, pin	Prunus pensylvanica L.f.
cotton-grass	Eriophorum spp.
cranberry, mountain	Vaccinium vitis-idaea var. minus Lodd.
crowberry, black	Empetrum nigrum L.
dewberry	Rubus procumbens Muhl.
dogwood, red-osier	Cornus sericea L.
ferns	Dryopteris spp.
fir, balsam	Abies balsamae (L.) Mill.
horsetail	Equisetum spp.
juniper, common	Juniperus communis L.
Labrador-tea	Ledum groenlandicum Oedr.
larch, American	Larix laricina (Du Roi) K. Koch
leatherleaf	Chamaedaphne calyculata (L.) Moench
maple, mountain	Acer spicatum Lam.
red	Acer rubrum L.
moss, club-	Lycopodium spp.
plume	Hypnum crista-castrensis Hedw.
reindeer-	Cladonia spp.
sphagnum	Sphagnum spp.
raisin, wild	Viburnum cassinoides L.
raspberry, wild red	Rubus idaeus var. strigosus (Michx.) Maxim.
sedge	Carex spp.
sheep-laurel	Kalmia angustifolia L.
spruce, white	Picea glauca (Moench) Voss
black	Picea mariana (Mill.) BSP
yew, Canada	Taxus canadensis Marsh.

REFERENCES

Atkinson, H.J.; Giles, G.R.; McLean, A.J.; Wright, J.R. 1958. Chemical methods of soil analysis. Contrib. 169. Chemistry Division, Science Service. Can. Dep. Agric. Ottawa, Ont.

Bouyoucos, G.J. 1962. Hydrometer method improved for making particle size analysis of soils. Agron. J. 54:464-465.

Canada Land Inventory. 1965. Soil capability classification for agriculture. Rep. No. 2. Can. Dep. Forestry, Ottawa, Ont. 16 pp.

Canada Soil Survey Committee, Subcommittee on Soil Classification. 1978. The Canadian system of soil classification. Can. Dep. Agric. Publ. 1646. Supply and Services Canada, Ottawa, Ont. 164 pp.

Evening Telegram. 1954. St. John's, Nfld. 1 Sept. p. 8.

Government of Canada and Government of Newfoundland. 1954. Fishing communities of Newfoundland: Report of a survey sponsored by the governments of Canada and Newfoundland. Mimeo. St. John's, Nfld.

Gutsell, B.V. 1949. An introduction to the geography of Newfoundland. Can. Dep. Mines and Resourc., Ottawa, Ont. 85 pp.

Hare, F.K. 1952. The climate of the island of Newfoundland: A geographical analysis. Can. Dep. Mines and Tech. Surv. Geogr. Bull. 2:36-38.

Jackson, M.L. 1958. Soil chemical analysis. Prentice Hall, Englewood Cliffs, NJ.

Johnson, H. 1954. The strontium deposits of Port au Port Peninsula. Geol. Surv. Can. Bull. 27:1-19.

McKeague, J.A. 1967. An evaluation of 0.1M pyrophosphate and pyrophosphate-dithionite in comparison with oxalate as extractants of the accumulation products in Podzols and some other soils. Can. J. Soil Sci. 47:95-99.

McKeague, J.A.; Day, J.H. 1966. Dithionite- and oxalate-extractable Fe and Al as aids in differentiating various classes of soils. Can. J. Soil Sci. 46:13-22.

Mehra, O.P.; Jackson, M.L. 1960. Pages 317-327 in 7th National Conference on Clays and Minerals. Pergamon Press, New York, NY.

Munsell soil color charts. 1975. Munsell Color, Baltimore, MD.

Murray, A.R., Harmon, T.J. 1969. A preliminary consideration of the factors affecting the productivity of Newfoundland streams. Can. Fish. Res. Board Tech. Rep. No. 130. 405 pp.

National Soil Survey Committee of Canada. 1968. Proceedings 7th Meeting, Edmonton, Alta. 216 pp.

Parker, J. 1950. Newfoundland, 10th province of Canada. Lincolns-Prager, London, England. 157 pp.

Riley, G.C. 1962. Stephenville map-area, Newfoundland. Geol. Surv. Can. Mem. 323. 72 pp.

Rogers, J.D. 1888-1920. A historical geography of the British colonies. Vol. V, Part IV: Newfoundland. Clarendon Press, Oxford, England.

Smallwood, J.R. 1940. Handbook, gazetteer and almanac: An annual reference book. Long Bros., St. John's, Nfld. 326 pp.

Spurway, C.H. 1933. Soil testing. Mich. State Coll. Bull. 132. 35 pp.

Thornthwaite, C.W. 1948. An approach towards a rational classification of climate. Geogr. Rev. 38:55-94.

Toogood, J.A. 1958. A simplified textural classification diagram. Can. J. Soil Sci. 38:54-55.

Twenhofel, W.H., MacClintock, P. 1940. Surface of Newfoundland. Bull. Geol. Soc. Amer. 51:1665-1727.

United States Department of Agriculture. 1951. Soil survey manual, Handbook No. 18. U.S. Department of Agriculture, Washington, D.C. 503 pp.

Wylie, N.V.K. 1949. Newfoundland: An historical sketch. Can. Geogr. J. 38(4):148-173.

MAPS NOT

FILMED

CARTES

OMISES